Vol. 1 No. 1 Jan. 1978

INDUSTRIAL NEWS DIGEST

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Hillside Road, New Delhi-110012

INDUSTRIAL NEWS DIGEST

Vol.1, No.1, Jan. 1978

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Industrial News Digest is a monthly bulletin issued by the Publications & Information Directorate. A part of the newly-formed Industrial Information Service of the Directorate, the Digest aims at providing packaged, down-to-earth technological and techno-economic information to Industrialists, prospective entrepreneurs, and experts in both government and private agencies dealing with the management and planning of industry. Queries on technical and techno-economic matters are welcome.

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(CSIR), Hillside Road, New Delhi-110012

Abbreviations Used

1. B.S.	-	Business Standard
2. E.T.	-	Economic Times
3. F.E.	-	Financial Express
4. H.T.	-	Hindustan Times

Standard abbreviations are used in the case of all scientific and industrial periodicals.

NOT SO BRIGHT

Industrial Scene 1977-78

Many would call the heading of this essay an euphemism. However, to call the industrial situation in the current year "bleak", on the other hand, would be a statement liable to fall in another sector of error: pessimism.

Illusion in matters of economics is unpardonable, but a total lack of illusion, besides creating a climate of despondency, is not congenial to any earnest effort towards a betterment of the existing conditions. True, that we cannot catch up, let alone better, the 10% industrial growth rate registered in 1976-77 and, even according to the most optimistic estimate based on the industrial performance in the first 5 months (April-August) 1977-78, for which data are available, the growth rate cannot surpass 6%.

According to most experts the main reason of the encouraging industrial growth during 1976-77 was the remarkable increase in production of steel, coal and some engineering items by the public sector units. Popularly believed to be lazy white elephants, the giant public sector enterprises came out of the red during this year after an inordinately long gestation period.

OECD

Let us now for a moment forget about India, and have a look at the Organization for Economic Cooperation and Deve-

lopment (OECD) whose 24 members countries comprise almost the whole of the non-communist industrially developed nations of the world. The composite growth rate for the (OECD) countries was 3.5% during 1977 and the same is being predicte for 1978. The unemployment which was 5% in 1977 is likely to go up to 5.5% in 1978.

According to the Time magazine (9 January, 1978) the above figures "warn that the pattern of slow growth and high unemployment could become permanent for the world's industrial democracies, especially if governments throw up more protectionist barriers to trade in an attempt to save jobs." This should be true for India also, as long as the country aspires to join the bandwagon of "industrial democracies." Leaving aside "protectionist barriers," Indian industry is plagued by an acute shortage of power (see 2.1.1) and precious man-hours lost due to labour unrest and strikes which are the two main factors responsible for the fall of industrial growth rate in 1977-78.

Power Problem

According to Gadgil [Industr. Times, 1978, 19(26),5], there are no immediate solutions to the power problem. During the summer of 1977, power cuts ranged from 20% to over 40% in some of the States. Although the situation eased due to a good monsoon, we are unlikely to get rid of the power problem within a short period.

The Government is encouraging (and providing incentives to) industrial units to set up captive power plants. Gadgil is of opinion that, while this move may ease the situation, it may take a long time. At the same time he criticizes the move as "a very wasteful and expensive way of obtaining power, and industries subjected to price control may not be able to afford it."

There is also a move by the government to import larger power plants. But, reportedly, BHEL is opposed to this move. On the top of all these, the State Electricity Boards are suffering from a lack of financial resources for setting up new power plants or increasing the capacity and/or efficiency of the existing ones.

Recession

Industrial recession is arising from the fact that many industries like engineering (specially tractor), textiles, etc. are unable to sell their products at the existing prices. Consequently, there is a fall in capacity utilization in these industries. Target of coal production has been, scaled down. Demand for fertilizers has gone up only after sharp reduction of prices. As far as consumer goods are concerned, the fall in purchasing power of the people has brought down the production. All these factors have created an atmosphere of "stagflation" in the country which is a serious bar to industrial growth.

TABLE 1 - OUTPUT OF SELECTED INDUSTRIES*

	Unit	Apr.-Aug. 1976	Apr.-Aug. 1977	Change(%
Coal	'000 tonnes	41,403	40,137	(-) 3.1
Pig iron	"	4,021	4,015	(-) 0.1
Saleable steel	"	2,789	2,883	(+) 3.4
Aluminium	"	87.9	68.8	(-)21.7
Sugar	"	528	625	(+)18.3
Vanaspati	"	205.5	250.0	(+)21.6
Cotton cloth (mill sector)	Mill.mts.	1,802	1,734	(-)3.8
Cotton yarn	Mill.kgs.	487	463	(-) 4.9
Jute manufactures	'000 tonnes	470	468	(-) 0.5
Nitrogenous fertilizers	"	738	788	(+) 6.8
Phosphatic fertilizers	"	176	264	(+)50.0
Cement	"	7,679	7,853	(+) 2.2
Commercial vehicles	Nos.	18,646	16,017	(-)14.1
Railway wagons	"	4,802	4,404	(-) 8.3

*Margin, 1977, 9&10(4&1), 13.

Production

The output figures of some selected industries for the first 5 months of 1977-78 compared to the same period for 1976-77 are shown in Table 1. It can be seen that while there was a declin

in output in case of coal, aluminium, cotton cloth and yarn, pig iron, railway wagons, jute manufactures, and commercial vehicles, there were increases in the production of sugar, saleable steel, vanaspati, nitrogenous and phosphatic fertilizers and cement. The maximum decline of 21.7% occurred in aluminium, while an impressive increase of 50% was made in the output of phosphatic fertilizers.

Exports

Indian exports show quite a bright prospect compared to the general industrial situation. A retrospective view reveals that the first two Plans showed only a nominal increase in exports. Some new policy measures, including liberalising imports of raw materials, issue of automatic licences, and considerable procedural simplification gave a boost to exports amounting to 13.7% during the Fourth Plan. The buoyancy in exports continued during the Fifth Plan, and 1974-75 and 1975-76 saw exports rise by 31.9% and 18.4% respectively.

Exports in 1976-77 were worth Rs 5,134 crores, registering a growth rate of 27%. The export target for 1977-78 is fixed at Rs 6,000 crores. However, according to Dr P.C. Alexander, Secretary, Union Commerce Ministry, it would not be possible to reach the target due to reduced offtake by some of the traditional buyers of Indian goods. The total export for 1977-78 is now expected to be in the region of

Rs 5,750 crores, which will mean an increase of 12% over last year's figure, (For further details, see Commerce, 1977, 135(3468), Feature on Exports 1976-77.)

In the bright picture projected by Indian experts, Gadgil sees some "dark shadows." According to him, the Middle Eastern market is getting saturated. Also, world economic and industrial progress have slowed down due to the "protectionist trends" mentioned earlier, and this is sure to have an adverse reaction on Indian exports in the coming years.

Policy

"Whatever can be produced by small and cottage industries must only be so produced," said George Fernandes, Union Minist for Industries, while outlining the new industrial policy of the Government of India. This seems to be one of the major guiding principles of the policy, as the list of 180 items of industrial products reserved for the small scale sector has been enlarged to include more than 500 items. The laudabl expectation that underscores the emphasis on small and cottage industries is that it would help in the creation of a just and equitable society in which the benefits of industrial development would be shared by the people of the nation.

As for the large scale sector, the broad areas it will cover will be : (i) basic industries which are essential for providing infrastructure as well as for development of small

and village industries, such as steel, non-ferrous metals, cement, oil refineries; (ii) capital goods industries for meeting the machinery requirement of basic industries as well as small scale industries; (iii) high technology industries which require large scale production and which are related to agricultural and small scale industrial development such as fertilizers, pesticides and petrochemicals; and (iv) other industries which are outside the list of reserved items for the small scale sector and which are considered essential for the development of the economy, such as machine tools, organic and inorganic chemicals, etc.

The large scale sector (specially the large "business houses") would continue to be subject to the MRTP Act, and they will have to rely on internally generated resources for financing new and expanding existing projects. While assigning an "expanding role" to the public sector, the policy expects that it would not only be a producer of important and strategic goods of basic nature, but would also serve as an effective stabilising force for maintaining essential supplies for the consumer.

To prevent the concentration of industries around metropolitan and urban centres, the Government has decided not to give licences to new industrial units within certain limits of large metropolitan cities having a population of more than 10 lakhs and urban areas with a population of more than 5 lakhs. To help existing large industries to move out

of the congested areas, the government will consider giving some assistance.

Foreign investment and acquisition of technology would be allowed only on such terms as are determined by the government to be in the national interest.

For Indian joint ventures abroad, the government would be willing to consider reasonable cash investment up to a specified limit.

Considering the essence of the policy as stated above, there can be no denying the fact that there are many plus points in it. The emphasis on social justice, greater participation of the people in industry, and proliferating the gains of industrial development among greater number of people is praiseworthy. Of course, the effective implementation of the policy would require great efforts and very astute planning.

For once, it seems, a clear demarcation of areas and roles has been made regarding the large and small/cottage sectors. This should do away with a lot of confusion. The problem lies with the effort needed to raise the small/cottage sector from a producer of ancillaries to that of many "primary" goods.

The stress on decongesting urban and semi-urban conglomerations is an essential step in improving the living conditions and environs of people of these areas.

It will also check the distressing trend of migration of the rural population to already overcrowded towns and cities. However, the problem of infrastructural facilities, e.g. communication, water supply nearness to markets, etc., will form a formidable barrier in setting industrial areas away from cities and big towns.

To sum up, the policy is a refreshing one in spite of the fact that many skeptics are likely to view it as too idealistic to be realized in practice. However, it should be realized that thinking progressively and in advance is always better than to stick to a <u>status quo ante</u> in the marbid fear that the goals set as a result of such thinking would be unachievable. So, let us say that a start has been made in the right direction as far as Indian industry is concerned until history proves us wrong.

2. INDUSTRIAL NEWS

2.1 GENERAL

2.1.1 Power - Despite the creation of an average additional capacity of about 1,700 MW, power shortage continues to plague the country. According to the Tenth Annual Electrical Power Survey, conducted by the Punjab, Haryana and Delhi Chambers of Commerce and Industry (PHDCCI), power requirement for the whole country is expected to jump from 100,740 million kwh in 1977-78 to about 185,064 million kwh in 1983-84. Still there will be deficit of about 17,000 million kwh. In the northern region, covering Delhi, Punjab, Haryana, J & K, Chandigarh and Rajasthan, the current deficit of 2,795 million kwh is expected to touch 4,097 million kwh in the above period.

Between the generation of power and its availability there is a gap of about 20%, which is caused mainly by power loss in transmission. To minimize this loss, PHDCCI has suggested the large scale use of capacitors. Different techniques according to varying circumstances will also have to be employed to store electrical energy, improve power flow and control wastage. In the matter of improving power generation capacity, PHDCCI has urged the Bharat Heavy Electricals Ltd to put more efforts in this direction.

Rural Electrification - The Rural Electrification Corporation (REC) has sanctioned a loan of Rs 10.7 crores

to 8 States for electrification of rural areas. It is expected that more than 1,300 small scale industries will be benefitted by this scheme. In addition, 6 mini-projects for employment oriented small scale industrial estates are envisaged. With this, the REC-assisted projects will add up to 1,739, and about 1.37 lakh small industrial units will be energized in the areas covered by the scheme (E.T., 30.11.77; Hindu, 6.1.78).

2.1.2 Rural Bias in S & T Plan - A note prepared by the Planning Commission outlines the five-year strategy for science and technology. According to this, a firm link will be stablished between heavy industry and rural development. The programmes in the areas of village industries, rural energy sources, natural resources, etc. will be oriented to meet the basic needs of the rural masses and increase the employment potentialities of rural areas.

Foreign technologies will be selectively imported. Side by side, incentives will be given to develop indigenous technologies. Technical collaboration arrangements have to be approved by a Foreign Investment Board of the Planning Commission. A technical committee will evaluate the available indigenous technologies and suggest ways and means to upgrade them. The committee will also evaluate the need of those foreign technologies which are proposed to be imported (E.T., 18.12.77).

2.1.3 New Information Service - The Committee on Science and Technology in Developing Countries (COSTED), a scientific committee of the International Council of Scientific Unions (ICSU) has recently started a new Appropriate Technology Information Service (ATIS). A major activity of this information service is to publish a periodical newsletter which wi focus attention on urgent problems of developing countries and possible methods of solving them. This newsletter will be published for COSTED by the Indian Society for Information Sciences (ISIS). Further information on ATIS can be had from: Scientific Secretary, COSTED, Indian Institute of Science, Bangalore-560012 [Science for Villages, 1977, 1(2), 6].

2.1.4 Industrial Safety - The 17th Indian Standards Convention, held at Jaipur in December, 1977, stressed the need for creating monitoring facilities within the industrial establishments to evaluate the deterioration in safety standards with the passage of time in the already approved machinery and equipment so that suitable remedial measures could be taken from time to time.

Dr. S.S. Ramaswamy, Director General, Factory Advice Service and Labour Institute, Bombay, said that over 60 per cent of accidents in industries were due to human factors. To ensure a greater measure of industrial safety, an army of well trained people is necessary to implement

safety measures. There is also need for instituting regular training programmes for educating the workers on safety measures to bring down the accident rate which is much higher in India than in the industrialized countries of the West (B.S., 4.12.77).

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ENGINEERING INDUSTRY

.1 Plan for Machine Tool Industry - The overall prospects for the Indian Machine tool industry appear to be bright. The distinct possibility of larger demand both at home and abroad, specially for metal cutting and forming machines and machines for plastics, glass, wood, portable electric and pneumatic tools, has prompted the Ministry of Industry to envisage a massive expansion plan for the industry. An investment of Rs 124 crores has been earmarked by the Ministry for this purpose for the nexe five-year period (1978/79 - 1983/84). The schemes drawn up in this direction, besides substantial expansion of the existing units, include settling up of a number of new units, particularly in the small scale sector. After the completion of these schemes, the production of the industry is expected to increase by Rs 300 crores/yr in terms of value.

Production of machine tools in 1976-77 was of the order of Rs 117 crores. However, the production during current year is not expected to exceed Rs 120 crores due to various constrains (Engng Times, 22.12.77).

2.2.2 Smokeless Domestic Oven - The Central Mechanical Engineering Research Institute, Durgapur, has developed a smokeless, regenerative and high efficiency domestic oven which has been judged as the best design in an all-India competition organized by the Coal India Ltd.

The oven consists of a cylindrical core chamber with an annular chamber round it. The annular chamber is closed at the bottom and has a removable top cover. During normal cooking, coal fines are kept in the annular chamber which, beside providing insulation, acts as a regenerator because it utilizes a portion of the heat energy (which is normally lost in conventional domestic oven) to produce coke for subsequent burning in the core chamber as smokeless fuel.

During the process of coke formation, volatile gases are generated in the annular chamber which are burnt either in a separate gas burner or inside the bed. In either case, heat utilization capacity of the oven is higher than conventional ovens [Industr. Times, 1978, 20(1). 36].

2.2.3 A New High Strength Alloy Steel - The National Metallurgical Laboratory (NML), Jamshedpur, has developed a process for the production of a new high strength low alloy steel. Designated MA 602, this steel has an attractive combination of high proof stress and good ductility and weldability.

The steel was made in NML's 0.8 tonne arc furnace, and rolling was done in different parts of the country. Another characteristic of this hot-rolled alloy steel is that it can easily replace twisted bars as per IS:1786. The above qualities make this alloy steel suitable for making beams, channels, angles, forging-quality blooms, billets, etc.

The NML - developed alloy steel is being produced by the Rourkela Steel Plant. Already, about 3,000 tonnes of this steel has been supplied to Bhilai Steel Plant for its expansion [Sci. Reptr, 1978, 15(1), 69].

2.2.4 The Watt-Miser - The General Electric Company, USA, has developed a new mix of phosphors which will provide almost as much light as the standard GEC-tubes available in the market, but at a reduced power input. This has been achieved by some modification of wavelengths in the deep blue and deep red regions of the spectrum. The change in the colour of composite light due to these modifications is imperceptible to the human eye. The new lamps - aptly named Watt-misers - will take 35 Watts for 86 lumens per Watt against the company's current 40 Watt, 80 lumens per Watt tubes. Experiments have shown that a 12.5% reduction of power can be achieved at a sacrifice of only 3% of light output (Hindu, 2.1.78).

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2.3 CHEMICAL INDUSTRY

2.3.1 Pulps & Drugs from Plants - Scientists of the National Chemical Laboratory (NCL), Pune, have succeeded in obtaining rayon grade pulp, and some drugs and several useful chemicals of industrial importance from Indian plant sources. Mesta stems (Hibiscus cannabinus) and Dalbergia paniculata wood have given excellent chemical pulp. Standard quality pulp for rayon yarn has been obtained from Boswellia serrata (Salai wood). The NCL scientists are also testing cotton linter pulp for viscose rayon. In another experiment, NCL scientists have obtained a chemical parthenium from Parthenium hysterophorus (Carrot grass) which is known to possess anti-cancer activity. A number of parthenium derivatives have been prepared which will be tested at the Cancer Research Centre, Bombay, for their anti-cancer activity.

Another team of scientists at NCL has obtained vanilin from groundnut shell which is an agricultural waste available in large qualities in the country. A process is being developed for obtaining maximum yield of this important industrial chemical.

Flavones (plant colours) have been obtained from the bark of Morus alba (Mulberry).

Scientists at NCL are also testing whether neem can be added to soil with fertilizers for better use of nitrogen

by plants. Several extracts of neem oil have been tested and the extract showing the maximum effects on slow release of nitrogen to the soil has been identified. The main component is oleic acid. If the experiment succeeds, considerable qualities of urea can be saved by adding neem oil or neem cake to the soil.

Another group of scientists at NCL has developed a process for the manufacture of quinapyramine sulphate and quinapyramine chloride which are valuable veterinary drugs. The entire quantity of these drugs costing nearly Rs 1 crore in foreign exchange is imported at present. The NCL process is ready and will soon be offered to industry.

Two alkaloids vincristine and vinblastine have been obtained from Vinca rosea (Sadaphuli) leaves which have been proved to be effective against leukemia. Work on the isolation of the alkaloids from plant using modern methods of chromatography is in progress (CSIR Press Release).

2.3.2 Trichlorobenzene - Trichlorobenzene (TCB) is used as a solvent in the chemical manufacturing industry, particularly dyes and intermediates. It can be used as a dielectric fluid, synthetic transformer oil and heat transfer medium. It is also used in the manufacture of tetradifon (an insecticide), as such or after fractionation.

The National Chemical Laboratory (NCL), Pune, has developed a process for the manufacture of TCB which consists in dehydrochlorination of non-gamma benzene

hexachloride (BHC) in the presence of alkali. Non-gamma BHC is a waste product obtained in the manufacture of lindane (gamma-benzene hexachloride).

The process has been standardized on pilot plant. The product obtained by the laboratory contains about 88% 1, 2, 4-trichlorobenzene with only about 12% of the 1, 2, 3-isomer. The product can be directly used for the manufacture of tetradifon, for which NCL has already developed a process.

Non-gamma BHC and caustic soda lye (48-60%) are the main raw materials required for the manufacture of trichlorobenzene, and both these are available indigenously.

Jacketed reactor (MS) with stirrer and flush bottom valve, condenser (MS), storage tanks (MS), settler (MS), pumps and boiler are the main items of plant and equipment. These are either available indigenously or can be fabricated locally.

The minimum capacity of an economically viable unit, as assumed by NCL, is 300 tonnes/yr. The capital outlay for a plant of this size has been estimated at Rs 9.87 lakhs (Rs 5 lakhs on land, building, plant, equipment, etc., and Rs 4.87 lakhs as working capital). The ex-factory cost of production comes to Rs 4.85/kg.

Process know-how for trichlorobenzene has been released for commercialization to Mycol International Chemicals, Madras, through the National Research Development Corporation of India.

Further particulars can be had from: Managing Director, National Research Development Corporation of India, 61 Ring Road, Lajpat Nagar-III, New Delhi-110024 (CSIR News, 15.12.77)

.3.3 Pepsin from Animal Waste - Pepsin is used in the pharmaceutical industry in multienzyme therapeutic preparations. It is also used for bating of leather and for giving lustre to silk thread, in the preparation of peptone, and in the food industry. At present, a large amount of pepsin is being imported. In 1975-76, 14,512 kg of pepsin valued at Rs 1,951,028 was imported.

The Central Drug Research Institute, Lucknow, has developed a process for preparing pepsin from slaughter-house waste. Work has been done on a laboratory scale. About 300 kg of pepsin have been prepared from buffalo stomachs and 20 kg from goat stomachs. The product has been tested by Unichem Laboratories, Bombay, and conforms to I.P. specifications.

The smallest economic plant should be able to process 100 buffalo stomachs per batch yielding about 1 kg of pepsin.

The main items of plant and equipment required are: waring blenders (cap. 2 litres), arrangement for filtration under vacuum or filter press, incubation room (cap. 100 litres), and vacuum shelf dryer.

All raw materials are available indigenously.

Further particulars can be had from: Managing Director, National Research Development Corporation of India, New Delhi (F.E., 11.9.77).

2.3.4 Demand for Solane-sol and Other Nicotine Derivatives - Solane-sol, a comparatively unknown derivative from tobacco waste, has become a money-spinning item in the international market. Not introduced in India till now, Solane-sol is used widely for heart-ailments in Japan and other developed countries. Because of its considerable medicinal value, it is in great demand and the manufacturers are finding it difficult to meet export orders.

There are a number of other derivatives from tobacco waste which have started entering the international market in a big way. Nicotine sulphate is used as insecticide in one of the derivatives. This item came into demand in the international market in 1973 as a replacement of certain synthetic organo-phosphate compounds. Nicotine sulphate is mainly manufactured in the small-scale sector around Guntur, Andhra Pradesh. Its export reached Rs 25 lakhs last year. The major buying country is Japan followed by West European countries and the USA.

Recently, items like niacinamide and nicotinic acid hydrazide, which have excellent use in the drug industry, are also being synthesized from nicotine sulphate.

Judging from the demand pattern in the international market, the earnings by way of exports of nicotine derivatives could easily be stepped up to the tune of Rs 3 crores by increasing their production (E.T., 6.10.77).

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2.4 MISCELLANEOUS INDUSTRIES

2.4.1 Recycling of Waste - A firm in Assam has been given the licence by the National Research Development Corporation of India for the manufacture of low-cost fire-proof roofing sheets by utilizing a process developed jointly by the Regional Research Laboratory, Jorhat, and the Central Building Research Institute, Roorkee. In this process, wastes like street sweepings, straw and bagasse are used as the raw materials.

The product is likely to be marketed by the middle of next year. The market price is expected to be about Rs 8/m^2. Initially the firm will produce about 8 tonnes, about 2000 m^2, of sheets/day.

The total capital outlay for a plant of 8 tonnes/day capacity would be about Rs 25 lakhs (CSIR News, 15.11.77).

2.4.2 Plastic Can Saves Energy And Space - An easy-to-open plastic can, which is heat and moisture resistant and virtually unaffected by any food, has been developed by AB Akerlund & Rausing, Lund, Sweden. Called Letpak, the

principal material used in its production is polypropylene. Energy consumed is less than what is required for production of metal containers.

A 0.4 litre can weighing only 25 gm has a pull-open lid that remains attached to the can body and does not cut fingers. Being rectangular in shape, its space requirement in shipping and storage is reduced by about 20%. A special sealing technique makes it impermeable to oxygen and moisture-vapour. Discarded packagings can be burnt, even in open fire, without causing ill effects to the environment.

Further information can be had from: Swedish-International Press Bureau, Skeppargatan 37, S-114 52 Stockholm, Sweden [Inv. Intt. 1977, 12(11), 482].

2.4.3 Soap from Paraffin Wax - The Hindustan Liver Research Centre, Bombay, in collaboration with the Indian Institute of Petroleum, Dehra Dun, has developed a technology for manufacture of toilet soaps from paraffin wax. Laundry soaps from paraffin were made by the Centre earlier in 1973.

In the above process synthetic fatty acids (SFA) produced from paraffin are used for soap making instead of the tallow and vegetable oils that are currently used.

The process of producing SFA from paraffin was originally developed by the Germans during the World War II and soaps made from paraffin are already in use in USSR.

A Rs 20-lakh pilot plant producing 100 kg/day of SFA from paraffin is already in operation at the above Centre. The plant is being scaled up by the Engineers India Ltd. However, commercial production of soap from wax has to wait until a steady supply of paraffin at a reasonable price is assured.

Commercialization of this process would put a stop to the import of tallow and release the scarce oils for other uses.

It would be economically feasible to produce soap from

Hindustan Organic Chemicals Ltd for the best performance

.6 Know-How for Small Units – Of late, Bata India Ltd has shown willingness to share its experience and expertise in the shoe-manufacturing and trade with the small scale entrepreneurs.

In the light of present fast changes in designs of shoes with the change in the fashion in affluent countries, the above offer would prove very vital for the growth of small scale sector.

At present, the developed countries import 300 million pieces of leather footwear a year valued at $1180 million. The share of the developing countries out of this sale is only 1.3%. This indicates the immense potential of India's footwear industry in the export field. Besides, about 10% of Indian population now wears shoes.

In the process, commercial sesame seed is cleaned in mechanical equipment to remove extraneous matter like clay, sand, dust and chaff. The cleaned seeds are treated with hot caustic soda lye solution, decuticled, washed and dried to obtain dehulled white sesame seed.

The raw materials required are commercial sesame seed and commercial grade sodium hydroxide. The major items of equipment are pre-cleaning equipment, dehulling equipment and seed drier [Chem. Polymer Times, 1977, 4(11), 7]

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3. ANNOUNCEMENTS

AWARDS

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.2 Chemexcil's Certificate of Merit has been awarded to the Hindustan Organic Chemicals Ltd for the best performance

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2.4.8 Fibreglass - A group of Indians settled abroad, in collaboration with some State and Central industrial promotion and financing agencies, is setting up a fibreglass unit, Twiga Fibreglass Ltd, in the backward district of Bullandshahr, U.P.

Estimated to cost about Rs 7.70 crores, the Twiga plant will have an initial annual capacity of 2,000 tonnes which will be later raised to 4,000 tonnes. The firm is likely to start production in October 1978.

The present demand of fibreglass in the country is about 15,000 tonnes, but only one unit (cap. 1,000 tonnes/yr) is manufacturing it. Twiga hopes to provide direct employment to 400 persons and generate over 10,000 jobs in the small and "tiny" sectors (B.S., 4.12.77).

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.2 Chemexcil's Certificate of Merit has been awarded to the Hindustan Organic Chemicals Ltd for the best performance in 1976-77 in the inorganic and organic chemicals group.

.1.3 Engineering Export Promotion Council Award has been given to the Fort Gloster Industries Ltd, Bowria (Howrah) for exporting paper insulated power cables to various countries, worth Rs 2.4 crores during 1976-77.

* * * *

.2 TRAINING

An Export Management Certificate Course is being organized by the Delhi Productivity Council from February 13, 1978. The Course will consist of promotion of export facilities and assistance, selection of products, identification of markets, export pricing, customs and tariff and procedures, and documentation.

Further information can be obtained from: Executive Secretary, Delhi Productivity Council, 1-E/2 Jhandewala Extension, New Delhi-110055, Phone No. 523828.

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3.3 PUBLICATIONS RECOMMENDED

3.3.1 Technical Information Services for Developing Countries, Ed. S. Radhakrishna and T.K.S. Iyengar; Pp. 344, Price Rs 35 ($7).

This publication is the outcome of the deliberations of a seminar organized by the Committee on Science and Technology in Developing Countries (COSTED) It can be obtained from Scientific Secretary, COSTED, Bangalore-12 [Science for Villages, 1977, 1(2), 8].

3.3.2 Principles of Dairy Processing by James N. Warner; Wiley Eastern Ltd, New Delhi; Pp. 317, Price Rs 22.

The 17 chapters of the book including dairy chemistry, processing, engineering, mathematics and microbiology are the contributions of the author's intensive study and research in the area over a long period at the Allahabad Agriculture Institute.

The book should serve as a useful reference to research workers and milk technologists [ISI Bull., 1977, 29(9), 325].

3.3.3 Technology and Refining of Oils and Fats by T.L. Mahatta; Small Business Publications, Delhi-110007; Pp. 400, Price Rs 60.

This book, divided into 12 chapters, gives a comprehensive account of the technology and refining of edible oils and fats. Appended to the book are important information like:financial outlays of small scale oil refining and vanaspati plants, a directory of major suppliers of raw materials, chemicals and machinery; ISI specifications; and selected references [Chem.Polymer Times, 1977, 4(11), 3].

3.4 Directory of Research Projects - The Department of Science and Technology, New Delhi, in co-operation with the scientific agencies of the country, is bringing out a comprehensive directory of the current research programmes in the field of agricultural, medical, biological, physical, natural and mathematical sciences in progress as on January 1, 1977. The directory, which is expected to contain details of 30,000 projects, will be brought out in 4 volumes in the first half of 1978.

Requests for questionnaires and any other clarification regarding the directory may be addressed to: Dr (Mrs) A.R. Rajeswari, Principal Scientific Officer, Department of Science and Technology, New Mehrauli Road, New Delhi-110029 (Engng Times, 22.12.77).

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3.4 INFORMATION AND TRADE CENTRES

3.4.1 A Polytechnology Clinic at Bombay has been approved by CSIR for a period of two years. The main aim of the Clinic is to solve problems of industries through the help of CSIR laboratories (CSIR News, 30.12.77).

3.4.2 An Information Centre for Food Technology at the Central Food Technological Research Institute, Mysore, as a part of the National Information System for Science and Technology (NISSAT) has been approved by the Department of Science and Technology.

The objectives ofthe proposed information centre are: to provide information service to institutions and individuals concerned with food science and technology with emphasis on the information requirement of small scale, village and cottage industries. to function as a clearing house for information on all aspects of food science and technology; and to collaborate in the integrated development of various documentation/information systems in food science and technology and related systems in the country as a whole, and function as a feeder to similar international systems (CSIR News, 15.11.77).

3.4.3 The Visvesvaraya World Trade Centre at Cuffe Parade, Bombay, has gone on stream on January 14, 1978. The Centre is linked to World Trade Centres in New York, London, Brussels, Amsterdam, Moscow and Tokyo.

The main aim of the Centre is to provide advisory and consultative services for the promotion of industrial research and development of Indian industry and trade.

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5 FAIRS AND EXHIBITIONS

5.1 The Second Indian Engineering Trade Fair 1978 will be held at Pragati Maidan, New Delhi, from 2 to 13 February. For participations, etc. contact: Secretary Association of Indian Engineering Industry, 172, Jor Bagh, New Delhi-110003.

5.2 India Council of the Institute of Electrical and Electronics Engineers Inc. (N.Y.) is holding its annual convention and exhibition from 22 to 26 February, 1978, at Taj Coromandel, Madras-600034. The theme of the convention is Technology Towards Meeting Social Objectives. There will also be an exhibition of electrical and electronics items. Further details can be obtained from: Shri M.V. Chauhan, IEEE India Council, 38C Mount Road, Madras-600006.

Vol. 1 No. 3 Mar. 1978

INDUSTRIAL NEWS DIGEST

- INDUSTRY PROFILE
- INDUSTRIAL NEWS
- ANNOUNCEMENTS

PUBLICATIONS & INFORMATION DIRECTORATE, CSIR
Hillside Road, New Delhi-110012

INDUSTRIAL NEWS DIGEST

Vol.1, No.3, March 1978

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Industrial News Digest is a monthly bulletin issued by the Publications & Information Directorate. A part of the newly-formed Industrial Information Service of the Directorate, the Digest aims at providing packaged, down-to-earth technological and techno-economic information to industrialists, prospective entrepreneurs, and experts in both government and private agencies dealing with the management and planning of industry. Queries on technical and techno-economic matters are welcome.

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Publications & Information Directorate
(CSIR), Hillside Road, New Delhi-110012

Abbreviations Used

1. B.S. - Business Standard
2. E.T. - Economic Times
3. F.E. - Financial Express
4. H.T. - Hindustan Times

Standard abbreviations are used in the case of all scientific and industrial periodicals.

1. INDUSTRY PROFILE

CABLE INDUSTRY (I)

With the gradual overcrowding of overhead transmission wires, the idea of bunching number of such insulated wires and putting them in a small pipe like formation, later known as 'cable,' became a necessity around 1870. Consequently, the first cable was manufactured with lead-sheath over copper conductors insulated with paper and laid across Brooklyn Bridge in 1880. The Indian cable industry, however, got off the ground only in 1923 when the first cable unit was set up.

Cable industry occupies a vital place in the country's industrial scene. It turns out aluminium alloy conductors/ aluminium conductors, steel reinforced conductors (AAC/ACSR), and paper and PVC insulated power cables for transmission and distribution of electricity. Some other important products are: PVC and VIR cables for control, instrumentation, rural electrification and house-wiring purposes; cables for telecommunication purposes; cables for use in ships, aircrafts locomotives, mines, automobiles, TV and various other applications; and enamelled, paper and glass-covered winding wires and strips and continously transposed conductors, which are intermediate products for the manufacture of electric equipment cables for defence needs.

Raw Materials

The key raw materials required for manufacture of cables and conductors are copper, aluminium, copper-steel wires, lead, steel wires, steel tapes, insulating papers, enamel and varnishes, and a group of elastomers.

Conductors are generally made of copper, though aluminium conductors are frequently used for bare overhead power lines. A combination of high tensile galvanized steel wires around which aluminium wires are standard (ACSR) is frequently used for high voltage overhead lines carrying heavy loads of power. Steel-cored copper conductors consisting of circular copper wires round a core of high tensile galvanized steel wires are sometimes used, but the combination is economic only if copper prices are low.

Galvanized steel conductors are used for telegraph and telephone lines and occasionally for rural overhead distribution lines where the load to be carried is small and the voltage drop is of little consequence. For field telephone cables, where the current to be transmitted is small and a high degree of tensile strength is required, a composite conductor of tinned or galvanized steel and tinned copper wire is frequently employed. Such field telephone cables are insulated with rubber or polyvinyl chloride dielectric.

Flexible conductors required for welding cables, cables for mobile cranes and coal cutting machines, and for general purposes requiring rough usage are stranded in the same manner as ropes.

The dielectric for insulation is selected according to the purpose for which the cable is required. The more common materials employed are: paper impregnated with resin, oil or petroleum base, rubber, guttapercha, varnished cambric, PVC, vulcanized bitumen, magnesia, polythene, cotton, silk, enamel, paper, glass fibre, rayon and asbestos.

<u>Protective materials</u> - Paper-insulated cables are generally used in sheathed (with lead, lead alloy, or aluminium) form. If required for use underground or in situations in which mechanical damage is likely to be caused, they are armoured with galvanized steel wires or tapes. Fibrous materials impregnated with weather-proofing compositions are used as bedding under the armour.

Rubber-insulated cables are protected by cotton tape and fibrous braiding impregnated with weather-proofing compositions. Guttapercha-insulated cables are armoured with galvanized steel wire.

The country depends mainly on imports for meeting the requirement of copper and insulating paper. The use of copper for overhead transmission is now mainly

restricted to railway electrification. Some of the units manufacturing paper have been attempting to develop insulating paper required by electrical industry. High tensile steel billets are being imported and so are the major raw materials for manufacture of tele communication cables. Demand of cable grade PVC is being met fully with indigenous production.

Present Status

At present, there are over 100 cable units in the large scale sector and over 400 in the small scale sector. The industry is well developed and is able to meet most of the requirements of power and industrial cables and wires indigenously. In keeping with modern trends set by advanced countries, there have been serious attempts in India too for developing special and sophisticated cables to meet the exacting demands of defence, industry and public utility oriented applications.

In the face of crippling power shortage, the cable industry operates at barely 50% of its rated capacity. It is quite likely that the Government might not favour granting new licences in the field of electricals for the next 3 years and prefer instead to encourage the industry to utilize fully its existing capacity and confine any expansion to its present structure and set-up. In the meantime, 5 cable manufacturers have been granted licence

for a fresh capacity of 15,000 km of PEX cable based on the cross-linked polyethelene technology which has to be imported.

The installed capacities of AAC/ACSR conductors (in tonnes), PVC cables (in km) and PILC (in km) in 1976-77 were 116,000, 18,020 and 9,560 respectively. According to the Fifth Five Year Plan (1974-79), capacity and production target for conductors (ACSR/AA) for 1978-79 are 113.12 and 90.0 thousand tonnes respectively.

[The second and concluding part of the profile on Cable Industry will cover the production of different types of cables in recent years and the anticipated production in 1980-81; separate accounts of Power, PVC/VIR and tele-communication cables; some new technologies; demand for different types of cables; and the export and import of cables. - Ed.]

2. INDUSTRIAL NEWS

2.1 GENERAL

2.1.1 Alexander Committee Report - The high powered Alexander Committee constituted on 1 November, 1977, to review the existing export-import policies and procedures has submitted its report to the government. The recommendations of the Committee generally favour "development" more than "controls" and are likely to lead to a long term strategy regarding exports and imports.

Regarding import of raw materials, spare parts and components for industrial uses, the Committee suggested two categories: (i) those which are restricted and (ii) those which are banned. Licences should be issued only for restricted items. It has been suggested that the number of licences issued to existing industrial units for restricted items be increased by 10%. In order to decentralize the issue of licences, regional offices of the Chief Controller of Imports & Exports (CCIE) should also be authorized to issue the same.

It has been recommended that items which are not specifically listed as restricted or banned should be permitted free import by industrial users without the formality of a licence. Till now, the policy was that any item which was not specifically indicated in the import policy book was assumed to be banned. It has been suggested that in

future imports should be permitted under Open General Licence. In order to minimise the risks of misuse the Committee has recommended that the 'actual user' condition may continue for one more year.

The Committee advocated abolishment of the quota licensing system for "Establishment Importers". Hereafter replenishment licences (REP licences) should be issued only for import of banned and canalised items and packing materials linked to the export products. Only that part of the material would be replaced through this system as are exported out of the country. Such REP licences would be transferable.

The Committee has recommended three basic principles for cash assistance for exports, viz. (i) compensation for indirect taxes in the production cost which are not refunded through the duty drawback system; (ii) compensation for freight and other differentials; and (iii) provision of initial promotional expenditure for new products and in developing new markets. Cash assistance would be admissible at the combined rate, and there would be no separate duty drawback rate.

Export and import policies should be stable for a period of three years, so that full advantage is taken by the industry.

About canalisation, the Committee has suggested that it should be restricted only to those items which provide

advantages of bulking, better service to consumers, preventing unfair trade practices and long term supply. A number of items have been identified by the Committee, whose exports and imports can be canalised.

Small Scale Sector - For giving boost to the small scale sector, the Committee has recommended the following measures.

1. In respect of canalised items, the State Small Scale Corporations could be permitted to bulk the orders on behalf of various small scale units and avail the delivery on high seas, thereby avoiding the payment of sales tax.

2. For other items, small scale units can place their indents with the above Corporations which, in turn, can arrange these inputs on their behalf.

3. The small units should be given all facilities which are available to recognized export houses.

4. Export Promotion Councils should constitute separate panels of small scale sector.

5. All small scale units should be granted licences under free foreign exchange.

The Committee has recommended the change in designation of the Chief Controller of Imports and Exports to Director General of Foreign Trade (DGFT). DGFT should continually review the cash assistance rates and other incentive schemes to provide suitable

advice to the government. DGFT should also be the focal point for dealing with the problem of exporters. In addition, DGFT should be engaged in export promotional activities like providing assistance in the field of information, import management, exporter servicing, and analysis of data on trade and prices [Econ. Commer. News, 1978, 8(6), 3; Capital, 1978, 180(4500), 185].

1.2 Appropriate Technology - The Industry Minister, Shri George Fernandes, has identified certain areas for the application of appropriate technology in backward areas. These are: (i) development of water technology pertaining to irrigation purposes and surface water problems for drinking purposes; (ii) conservation and disinfestation of foodgrains; (iii) harnessing of wild power; (iv) utilization of agricultural and vegetable wastes; (v) brick-making by single families for self-employment; (vi) timber cutting, wood processing, wood seasoning and utilization of timber waste products; (vii) leather tanning, sports goods and footwear; and (viii) appropriate farm structure and housing design, including improved technology for rural housing.

The government has undertaken a review of the various processes deployed in industry with a view to determining the appropriateness of the technology applied. In this context, Shri I.C. Puri, Development Commissioner Small

Scale Industries, has proposed the formation of a high level cell comprising representatives of the Indian Investment Centre, his office, and the recently formed Volunteers for India's Progress Club. The cell is likely to function as a reviewing and clearing house for proposals of investment in India by expatriate Indians and the import of technologies etc. with a view to the maximum application of appropriate technology [B.S., 23.2.78; Eastern Econ., 1978, 20(5), 217].

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2,2 ENGINEERING INDUSTRY

2.2.1 Exports - A target of Rs 650 crores for the year 1977-78 was fixed for the export of engineering goods. Total export rose by 18% during the first 8 months of the year as compared to the corresponding period for the previous year (see Table). Although lack of information makes it difficult to say whether the target has been achieved, it seems quite unlikely from the atmosphere prevailing in the field of engineering exports since about the middle of 1977-78.

Monthly Export Value (In Rs crores)

	April	May	June	Jul.	Aug.	Sept.	Oct.	Nov.	Total
1976-77	35.15	42.10	32.00	43.60	40.75	44.70	41.60	38.84	318.22
1977-78	51.10	36.10	47.58	42.32	53.00	48.00	55.00	45.00	378.10

The major impediments to the growth of engineering exports are: (i) slackening of demand in the over-stocked West Asian markets, and (ii) a sharp erosion in the dollar-rupee parity.

Exports to Arab markets, which comprised 55% of India's total exports in 1976-77, has gone down considerable during the present year. The reason is partly saturation and partly stiff competition from developed as well as developing countries.

An unprecedented 12% fall in the dollar-rupee parity has made a sizable dent in our export earning, specially because about 75% of the export orders are booked in terms ofthe US dollar (E.T., 28.12.77 & 27.2.78).

2.2.2 New Metal Sealing Technology - A special flexible metal sealing technology is being introduced in India by Fouress Engineering. A Rs 20 lakh plant is to be set up shortly. This technology, developed by Metroflex of England, enables isolation of ancillary equipment such as induced draft fans. The introduction of the new technology will be of primary importance to the continuous process plants (E.T., 20.2.78).

2.2.3 New Ignition System for Scooters - The Electronics Corporation of India Ltd has developed an electronic ignition system for use in scooters to replace in present

mechanical ignition system. The new system is more reliabl and efficient and enables greater fuel economy. It is reported that the electronic system gives the scooter an average of 6 km more per litre of petrol (E.T., 20.2.78).

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2.3 CHEMICAL INDUSTRY

2.3.1 Insoluble Titanium Anode - The Central Electrochemical Research Institute, Karaikudi, has developed Titanium Substrate Insoluble Anodes (TSIA) as a substitute for the soluble graphite anodes used in the chlor-alkali industry. The economics of these new anodes have also been worked out.

The cost of production of caustic soda is expected to come down by Rs 30 to 100 per tonne (depending upon the cell size and plant capacity), if the industry switches over to TSIA. The advantages of this change over are saving in electrical energy consumption and uninterrupted cell run.

These anodes have other industrial applications also. Diaphragm Cells using TSIA have been installed at DCM Chemical Works, Delhi, and the operating voltage has been found to come down to 3.5 v from 3.9 v at a capacity of 1,200 A.

In mercury cells installed at Hindustan Heavy Chemicals, Calcutta, the operating voltage came down to 3.9v

from 4.4 v, at a capacity of 20 kA. At Ballarpur Paper Mills, Ballarpur, the operating voltage was reduced to 3.3 v from 3.95 v, in the diaphragm cells where the capacity was 33 kA.

TSIA is being manufactured by Titanium Equipment and Anode Manufacturing Co. Ltd, Madras, under the scientist-entrepreneur scheme. This invention received the 1977 Independence Day Award of the National Research Development Corporation of India, New Delhi (F.E., 5.2.78).

.3.2 Phosphamidon - Phosphamidon is an important member of the enolphosphates group of organophosphorus pesticides. These occupy a unique position owing to their high systemic action combined with easy degradability and reduced residual effects as compared to chlorinated hydrocarbon pesticides. The demand for phosphamidon is estimated at 650 tonnes per annum by 1978-79.

The Regional Research Laboratory, Jorhat, has developed a process for the production of phosphamidon and identified the basic engineering component required for the process. The pilot plant operations are sufficient to allow a scale-up to a commercial production of 200 to 300 tonnes/annum(CSIR News, 30.12.77; F.E. 26.2.78).

.3.3 Methaqualone and Methaqualone Hydrochloride - Methaqualone is an accepted non-barbiturate sedative. Two Indian firms are at present engaged in its manufacture, with foreign

know-how and raw materials.

The Regional Research Laboratory, Bhubaneswar, has developed a new process for the manufacture of methaqualone and methaqualone hydrochloride. The raw materials used in the process are anthranilic acid or isatoic anhydride, o-toluidine, acetic anhydride and hydrochlori acid. Except isatoic anhydride all are indigenously available.

The plant and equipment required are: capacity glass assemblies (cap. 20l), filtration unit, vacuum pump, tray drier and heating mentel.

A plant of capacity one tonne per annum should be economically viable. The total outlay required to put up such a unit has been estimated at Rs 80,000. The break up is: (i) fixed capital on plant, Rs 42,000, and (ii) working capital Rs 36,000. The cost of production has been worked out to be Rs 137 per kg.

Further information can be had from: Managing Director, National Research Development Corporation, New Delhi

[*Chem. Ind. News*, 1977, 22(8), 607].

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2.4 MISCELLANEOUS INDUSTRIES

2.4.1 Microwax - The Indian Institute of Petroleum, Dehra Dun, has developed a process for the recovery and purification of

microcrystalline wax from tank bottom sediments of Ankleshwar crude oil. Till now these sediments were considered waste. The plant, costing about Rs 20 lakhs with a production capacity of 20 tonnes/month, has been set up by ONGC. Twenty tonnes of this microwax has already been exported to a firm in Los Angles. The microwax (m.p. 90.93°C) can be used in the manufacture of polishes, rust preventives, electrical insulation, paper coating and leather treatment [Econ.Trends, 1977, 6(24), 70].

2.4.2 Paper Boards - The know-how for the manufacture of paper boards for use in building and other construction works developed by the Regional Research Laboratory, Jorhat, in collaboration with the Central Building Research Institute, Roorkee, has been transferred to Benguet Electric Corporation of Philippines.

The know-how utilizes wastes like street sweepings, straw and bagasse for the manufacture of cheap, durable, light-weight, fireproof and waterproof roofing sheets and other construction materials (CSIR News, 30.1.78).

2.4.3 Novopan - The manufacture of Novopan, a new substitute for plywood and other coventional particle boards, will be started in India later this year. It can be utilized for: (i) interior decoration, furniture, tabletops, desks and doors; (ii) cabins, partitions, ceiling,

penelling and counters in offices; and (iii) special use, such as train coaches and ship interiors, etc.

The project, Novopan India Ltd, will be set up in the backward area, Pattancheruvu (Andhra Pradesh), by the Andhra Pradesh Industrial Development Corporation in collaboration with a foreign firm. However, the ownership of the project will be Indian. The project, which will cost Rs 5.5 crores, has a production capacity of 10,000 m^3 of particle wood/yr. The price of novopan particle board will be 33% less than teakwood or plywood and 40% less than one-phased laminate boards (E.T., 4.2.78).

3. ANNOUNCEMENTS

3.1 AWARDS

3.1.1 The Rotating Shield of the Engineering Export Promotion Council has been awarded to the Engineering Construction Corporation for being the top exporters in 1976-77 among civil engineering contractors.

3.1.2 Dr Vikram Sarabhai Awards for 1977 will be presented to five scientists on August 12, 1978 for their contribution in the fields of electronics and telecommunications: planetary and space sciences: atmospheric physics and hydrology; and systems analysis and management problems. Each award carries a medal and a cash prize of Rs 4000.

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3.2 PUBLICATIONS RECOMMENDED

3.2.1 A Directory on Foundry Industry has been brought by the Indian Foundry Association. Apart from serving as an effective link between manufacturers and buyers within the country, it will also help overseas importers to locate the Indian suppliers without difficulty (E.T., 19.2.78).

3.2.2 Techno-economic Feasibility Report on Vertical Shaft Kiln Cement Plant - The Regional Research Laboratory, Jorhat, has prepared a techno-economic feasibility report

for 30 tonnes/day capacity cement plant based on its work.

This report covers, among other things, equipment and layout for vertical shaft kiln plant; raw materials specifications; typical products analysis; and capital investment, cost economics and profitability. Other useful information like workshop facilities, laboratory equipment, project capital cost, raw materials and utilities requirement, and power requirements are also included (CSIR News, 30.1.78).

3.2.3 Industrial Relations in India - Basic Perspectives compiled and edited by S.R. Mohan Das. Industrial Relations Institute of India, 2-A, Prospect Chambers, Bombay-400001; Pp 108, Price Rs 15.

Besides management of industrial relations, the publication deals with other aspects of industrial relations as management of discipline, motivation, information system, grievance procedure, workers, participation in industry and the like (F.E., 29.1.78).

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3.3 FAIRS AND EXHIBITIONS

3.3.1 The First World Small Industries Fair and Congress would be organized at Calcutta by Federation of Small Industries of India sometime in October 1978. The Fair is entitled 'Small Industries 1978'.

3.3.2 The National Small Scale Industries Fair (to be organized by the Trade Fair Authority of India) will be held at Pragati Maidan during November/December, 1978.

The Fair will offer opportunities for display, advertisement and information feedback to the small scale industries engaged in the manufacture and development of a large number of goods and services.

3.3.3 The 34th International Fair Plovdir will be held in Bulgaria from 3 to 10 September, 1978 to display the latest achievements in the field of science and technology. There will also be exhibitions of: (i) electronic calculating and measuring apparatuses, and household and industrial electronics (from 6 to 10 June, 1978); (ii) household and consumer goods (from 1 to 8 November, 1978).

Further details can be obtained from: Directorate of International Fairs - Plovdir, Bulgaria, 37 Georgi Dimitrov Blvd. Telegrams: The Fair Plovdir, Telex: 044432.

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3.4 SEMINAR

The Federation of Small Industries of India in collaboration with the Orissa Small Industries Association is organizing a seminar on small industries in Cuttack some time in April/May.

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Hillside Road, New Delhi-110012

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Vol.1, No.4, April 1978

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Standard abbreviations are used in the case of all scientific and industrial periodicals.

1. INDUSTRY PROFILE

CABLE INDUSTRY (II)

In Part I of this profile, the installed capacities of AA/ACSR conductors (in tonnes), PVC cables (in km) and paper installed lead covered (PILC) cables (in km) in 1976-77 are given as 116,000, 18,020 and 9,560 respectively. It can also be seen from there that the 1979 target capacity of 113,120 tonnes set for AA/ACSR conductors has already been exceeded.

Production figures for AA/ACSR conductors, PVC/VIR (Vulcanized India Rubber) cables, PILC cables and telecommunication cables for the years 1974, 1975 and 1977 are given in Table 1.

TABLE 1 - PRODUCTION OF CABLES

	1974	1975	1977
AA/ACSR conductors (in thousand tonnes)	28	40	37
PVC/PILC cables (in thousand km)	16	13.7	16.23
PVC/VIR cables (in million core metre)	449.2	371.4	571
Telecommunication cables (in lakh conductor km)*	1.15	4.16	7.68+

*Figures do not include those for Rupnarainpur unit of Hindustan Cables Ltd.

+1976/77 figures.

It can be seen that only telecommunication cables have shown a steady and impressive increase in production during 1974-77. Production of PVC/VIR cables rose from 13.7 to 16.23 million core metres during 1975-77. However, it showed a sharp fall during 1974-75. Production figures for AA/ACSR conductors and PVC/PILC cables show fluctuating trends.

Power Cables (PVC/PILC)

At present, the bulk of the power cables are PVC cables, as these cables have replaced PILC cables for loads up to 6.6 kV. Consequently, there has been a decline in the indigenous use of PILC cables and the present production is mostly for exports.

Telecommunication Cables

Telephone cable is one of the most vital links in the field of telecommunication. Prior to independence, communication by telephone in India was limited and city telephone cables were entirely imported mostly from UK, Germany and Japan. After 1947, the demand for telephones grew suddenly. The Government of India, therefore, decided to set up a factory for manufacture of telecommunication cables. Thus, the Hindustan Cables Ltd (HCL) came into existence in 1952 with an initial capacity of 7.50 km cables/yr in Rupnarainpur (West Bengal).

Very soon it was found that its production capacity is inadequate. In addition to expanding the capacity, of this unit, a second unit was set up at Hyderabad which started production in 1974-75. HCL (barring TRACO, a small state government unit) is the only company licensed to manufacture telecommunication cables in the country.

At present, HCL produces the following items of telecommunication cables: (i) paper insulated underground telecommunication dry core cables, (ii) multi-channel coaxial trunk cables, (iii) plastic insulated switch-board wires and cables, (iv) aluminium sheathed cable, (v) copper coated steel wire, and (vi) special cables, viz. carrier frequency cables, coaxial interruption cables, radio frequency cables etc.

To take care of the growth of various telecommunication activities of the country, HCL have envisaged to increase its production and diversify its products. The marketing prospects of this commodity is quite good at home and abroad.

New Technologies

Indian cable industry is in the process of bringing into use for the first time in the country the West's advanced cross-linked polyethylene (XLP) technology for cables (briefly reported in Pt. I of this profile).

five different producers are setting up separately in collaboration with world renowned manufacturers at a considerable cost, a total capacity of 15,000 km/yr, of which 10,000 km is expected to be utilized by 1980-81.

The PEX cable (produced by the XLP technology) claims among its advantages much lower losses in distribution of energy, high current rating, toughness, long life and improved network flexibility. It is expected to overtake, but not overthrow altogether, the PILC cable. However, the XLP technology is regarded as a very costly.

Recently, fibre glass telecommunication cables with optical transmission technique without physical conductors have been developed at HCL. Other types of telecommunication cables with polythene insulation and sheathing, and aluminium sheathing have also been developed and introduced.

Demand

The demand for AA/ACSR and all alloy aluminium (AAA) conductors is related to the installed power generating capacity. Another constraint on demand of AA and ACSR conductors is the availability of resources and allocations made for transmission and distribution programme. With the emphasis on rural electrification, agriculture and irrigation the demand for AAC and ACSR conductors for supplying power to the rural sector has increased considerably.

The electrification of major trunk routes, should result in increased demand for cadmium-copper conductors. It is, however, dependent upon the procurement programme of railways and the progress in railway electrification.

The demand for power cables is dependent mainly on the type of distribution adopted in towns and cities. In most of the Indian towns electricity is distributed through overhead conductors, thereby reducing the demand of power cables for this purpose.

The Government of India has given top priority to power generation in its industrial policy. Plans are already being chalked out to raise generation through super thermal power projects, etc. (see 2.1.1). If these programmes are successfully implemented, the cable industry can look forward to a greater utilization of its capacity and enhanced demand for various types of cables. At a rough estimate, the demands for AA/ACSR conductors and PVC/PILC power cables in 1980-81 are likely to be of the order of 130,000 tonnes and 30,000 km respectively.

<u>Exports</u>

Though at present cable industry operates at barely 50% of its rated capacity, a very good part of the production finds its markets overseas. Export figures (in lakh rupees) in the recent past and anticipated over

next few years are indicated in Table 2.

TABLE 2 - EXPORTS OF CABLES

	1974-75	1975-76	1976-77	1977-78 (anticipated)	1980-81 (anticipated)
AAC/ACSR	423	536	501	500	700
PILC cables	1,081	1,415	1,780	1,700	2,000
PVC cables and wires, etc.	105	132	100	100	400

It can be seen from Table 2 that value added and relatively more versatile PILC cables account for the bulk of the exports. It may come as a revelation that out of an estimated Rs 23 crores of export earnings in current fiscal year, Rs 17 crores is expected to be owing to PILC cables.

Because of its greater elasticity even at high temperatures running to 300°C, PEX cable is likely to open up fresh dimension in the export field. It should find increasing acceptance, specially in the arid lands of the Middle East.

Besides PEX cables, exports of copper cables and conductors from India hold promise.

USSR is the principal buyers of Indian cables, besides Hungary, Singapur, Malaysia and Middle East countries.

Since some time past, HCL succeeded in entering the export market and is exporting cables to Kuwait, Muscat, Malaysia, Nepal, Sri Lanka, Fiji, Tonga, etc. With the growing reputation of the dry core cables exported by HCL the company is now flooded with orders. At present, HCL has firm orders worth Rs 10 crores in hand, while negotiations for orders worth Rs 37 crores are in progress.

TABLE 3 - IMPORT OF CABLES

	1974-75		1975-76		1976-77	
	Qty	Val	Qty	Val	Qty	Val
Dry core paper insulated telecommunication cables	77.32	15.65	27.12	6.29	3.75	0.68
Other insulated cables (Qty in lakh kg)	35.57	308.12	13.39	151.14	1.19	5.02
Lead alloy sheathed cables (light purpose)	12.49	1.46	700*	0.14	10.74	1.73
Paper insulated cables	40.78	5.14	103.93	86.05	200*	4,808†
Plastic insulated cables and flexes	32.22	4.14	48.25	6.44	10.19	1.26
Rubber insulated cables and flexes	895*	0.16	16.48	3.02	23.51	531
Varnished cambric insulated cables flexes	11.98	2.36	114*	2,040†	200*	0.14
Coaxial cables	547.69	142.03	312.95	40.42	57.51	16.85
Insulated cables cords flexes	311.92	31.04	827.75	161.3	325.61	52.86

*In metres. † In Rs.

Imports

In spite of its advance cable industry, India is importing substantial quantities of special and sophisticated cables from developed countries like USA, UK, Japan, West Germany and France. Imports (quantity in thousand metres, value in lakh Rs) of such cables for the last three years are given in Table 3 (With India - Ind. Prod., III, 173-75; Guidelines for Industries 1976-77, 223-24; Fifth Five Year Plan 1974-79, 148; Engng Times, 21.7.77 and 9.2.78; Information from HCL, Hyderabad; F.E. 13.1.73 and 24.8.73; B.S. 18.1.78 and 19.1.78; E.T. 24.1.78).

2. INDUSTRIAL NEWS

GENERAL

.1 Planning for More Power - In the draft plan for 1978-83 the outlay for power (Rs 15,750 crore) has been doubled as compared to that for the V Plan (Rs 7,016 crore). This means that in the next 5 years an additional electricity generating capacity of 18,500 MW has been envisaged. This capacity will comprise 13,000 MW of thermal, 4,550 MW of hydel, and 925 MW of nuclear power.

It will not be an easy job to realize the target of additional capacity, because against the requirement of adding 3,700 MW/yr for achieving the target the average rate of additional capacity installation at present is only 1,700 MW/yr. As a measure to increase the capacity for power generation, the government has sanctioned many of the pending projects and intends to set up a number of super thermal power projects in the central sector. Five such projects, viz. Singrauli, Ramagundam, Neyveli, Korba and Badarpur (Stage III), have already been sanctioned.

There are, however, many problems which will come in the way of expansion of power generating capacity. Continuous availability of coal and other infra-structural facilities for optimum operation of the giant plants are not assured. Moreover, doubts have been expressed on the

indigenous capacity to manufacture the 500 MW generator units required for the super thermal projects.

The target set for nuclear power appears unrealistic, specially on the face of a slowing down of the nuclear energy programme. The atomic power station at Rajasthan is still facing teething troubles, although it was installed in 1973 and the Madras reactor has not become critical so far.

On the whole, however, the stress on power generation in the draft VI Plan is quite heartening, as power shortage has been the main reason for the fall of industrial growth rate during 1977-78 (E.T., 22.3.77).

2.1.2 <u>Performance of Small Sector</u> - The total production in the small scale sector during the year 1977 was worth Rs 7,570 crores as against Rs 6,700 crores in 1976. The Small Industries Development Organization conducted a census survey of production from the year 1970 onwards. With 1970 as the base, the index of production was 228.82 in 1977 (as compared to 183.98 in 1975). The number of registered small scale units rose from 2.47 lakhs in 1976 to 2.69 lakh in 1977.

During 1975-76, the share of the small scale sector in the total exports of the country was 15.97%. In 1976-77, this figure rose to 17.07%. The actual value of exports was Rs 637.45 crore in 1975-76 and Rs 878.23

crore in 1976-77. This amounts to an increase of 40%.

According to the annual report of the Industry Ministry, special attention is being given to the development of ancillaries around bigger units. Two hundred large units were addressed to reformulate plans for giving maximum facilities to the ancillary units serving them. Out of these, 71 units have furnished their plans. In all states, state-level Ancillary Industries Committees have been set up (H.T., 28.3.78).

* * * *

2 ENGINEERING INDUSTRY

2.1 New Versatile Compressor - Atlas Copeo (India) Limited, has introduced a new portable compressor. It is mounted on two wheels and has a capacity of 9.5 m^3/min at 75 kg/cm (100 psig). This compressor is powered by the Ashok Leyland diesel engine, type ALU 400. This compressor can be easily towed by a jeep or a car and is convenient for on-site handling at industrial units, construction sites, mines and water-well drilling sites. As a semi-portable unit for trunk mounting it is also available with a skid frame [Industr. Times, 1978, 20(2), 35].

2.2 Domestic Fuel from Assam Coal - The Regional Research Laboratory, Jorhat, has developed a new process for manufacturing fuel pellets/nodules from Assam coal which

contains many impurities and high sulphur. The average heating value of these nodules will be 20,000 Btu/kg. It is quite cheap. The cost of fuel for a small family will be only 25 paise per day.

The Coal India Ltd (CIL), has shown interest in this project [J. Inst. Engrs, 1978, 27(7), 23].

2.2.3 Oil-fired Coke Oven - A novel byproduct recovery coke oven has been developed by the Central Fuel Research Institute (CFRI), Dhanbad. The new experimental coke oven is designed for furnace oil firing and has a coal charging capacity of 1,000 kg/batch. The oven can be heated to operational temperature within three days. The main features of this oven are: (i) steady flue temperature, (ii) uniform carbonizing condition, (iii) flexibility in operation, (iv) easy maintenance and (v) good choice of refractories to withstand repeated heating and cooling as per the new schedule of operation (F.E., 13-2.78).

2.2.4 Export Oriented Batteries Project - Chloride India Ltd, has undertaken a fully export oriented Rs 3 crore project, at Haldia in West Bengal. The capacity of this unit will be 4.5 lakh automotive and 50,000 heavy duty motor power batteries per annum. It will be commissioned in 1980 and is expected to reach full production in 1983 when the annual turnover will touch about Rs 8 crore (F.E, 12.1.78).

2.5 New Tool Grinding Device - Shri K.X. Benedict of Cochin has invented a new low cost device for grinding lathe, shaper and planner tools, e.g., tools for recessing, cutting, surface turning, boring, planning and square thread cutting. The tools can be grinded, either independently or simultaneously, very quickly and precisely with the help of the new grinding device. This simple device can be made in any workshop.

Technical details can be had from: Shri K.X. Benedict, Kurupacherry House, Ochenthuruth, Cochin 682508 [Invention Intelligence, 1977, 12(11), 449].

*   *   *   *

3 CHEMICAL INDUSTRY

3.1 Petrochemicals - A four-fold growth has been envisaged for the petrochemicals industry during the next decade, 1978 to 1988.

The licensed capacity of ethylene production, which is considered the yardstick for petrochemicals growth, is estimated to increase from 2.40 lakh tonnes in 1977 to 4.70 lakh tonnes by 1983 and 9.2 lakh tonnes by 1988.

This means an average compound growth rate of 13 per cent per annum according to the Perspective Plan for Petrochemicals (1978-1988) prepared by the National Organic Chemicals Industries Ltd.

The total capital investment requirement for additional capacities in the petrochemicals sector during the next 10 years is estimated at Rs 3,200 crores, based on 1977 costs and excluding escalation. This sector also includes the basic plants for manufacture of olefinic and aromatic building blocks, downstream plants for manufacture of chemicals and polymers, and processing plants for plastics, synthetic rubber and fibre.

The expenditure has been phased out at the rate of Rs 1,200 crores by 1983 and Rs 2,000 crores by 1988. The perspective plan has assumed that the capacities of individual plants would be optimised to take advantage of the economics of scale. A larger number of relatively small units would require much more capital investment than indicated, the report said.

While the additional employment is estimated at 2.2 million by 1983 and six million by 1988, the additional capital investment per person employed is placed on an average of Rs 5,400.

The 10-year perspective plan has also envisaged that exports of petrochemical products would be raised to about Rs 80 crores and Rs 250 crores worth by 1983 and 1988 respectively (F.E., 24.1.78).

2.3.2 <u>8-Hydroxyquinoline from Quinoline</u> - 8-hydroxyquinoline is used as an intermediate for the production of halogenated 8-hydroxyquinolines, used for the treatment of

gastro-intestinal infections of amoebic and bacterial origin. 8-hydroxyquinoline is also used as a fungicide and as an analytical reagent. A new process has been developed by the Central Drug Research Institute (CDRI), Lucknow, for the conversion of quinoline into 8-hydroxyquinoline.

At present, 8-hydroxyquinoline is being produced by a few manufacturers using imported know-how and with imported raw materials. The CDRI know-how makes use of indigenous raw materials with only quinoline as an exception. The demand for 8-hydroxyquinoline is estimated at 450 tonnes in 1978-79 and 600 tonnes by 1983-84. The import of 8-hydroxyquinoline in 1975-76 was 53,600 tonnes worth Rs 33.44 lakh.

The capital outlay for a suggested plant of 30 tonnes/yr as: (i) fixed capital on building, Rs 2.8 lakh; (ii) fixed capital on plant, Rs 9.3 lakh; (iii) working capital, Rs 5.9 lakh; and (iv) cost of production, Rs 82/kg.

Further information can be had from: The Managing Director, National Research Development Corporation, New Delhi [Chem.Ind.News, 1977, 22(8), 608].

3.3 A New Catalyst - The R & D Division of the Fertilizer Corporation of India, Sindri, has developed a new steam-naphtha reforming catalyst and getting successful

results from it at the Corporation's Barauni plant. The catalyst will be a suitable replacement for the imported catalyst which is being used at present. The annual demand for this type of catalyst in India is worth Rs 2 crores (E.T., 29.1.78).

2.3.4 Troubles of Small Rosin Units - Due to a steady fall in the output of rosin gum (74,000 tonnes in 1975-76, 63,000 tonnes in 1976-77, and about 56,000 tonnes in 1977-78) and allegedly non-uniform distribution policy, the small rosin units in H.P. and J & K are facing difficulties. Added to the non-availability of rosin gum, its price has also shot up in 1977-78 from Rs190 to Rs 425/quintal (E.T., 6.3.78).

* * * *

2.4 MISCELLANEOUS INDUSTRIES

2.4.1 Mukerian Paper - The Punjab State Industrial Development Corporation in collaboration with an entrepreneur has set up a paper mill at Mukerian, in Hoshiarpur (an industrially backward area of Punjab). The project costing Rs 4 crore, with an installed capacity of 9,000 tonnes/yr will go into production in August 1978. The paper mill will manufacture printing, writing and packing paper, using agricultural wastes as raw material (E.T., 6.3.78).

4.2 Conveyer Belting - Nirlon Synthetic Fibres & Chemicals Ltd has set up a plant at Roha, a backward area in Kulaba near Bombay, for manufacturing conveyer belting. The plant costing Rs 6 crores will have an output of 1,200 tonnes/yr. These conveyer belts will be useful for heavy industries like steel, mines, thermal power stations and handling materials in ports.

In addition to manufacturing conventional cotton and PVC beltings, the plant will also manufacture 100% synthetic fibre reinforced belting for the first time in India (H.T., 31.3.78).

4.3 Leather Finish Based on Natural Rubber - A research project at the Central Leather Research Institute, Madras, sponsored by Rishiroop Polymers Pvt Ltd, Bombay, has resulted in the invention of a leather finish based on natural rubber.

Till now rubber was used only as an adhesive in the leather industry. The new finishing has superior properties of gloss, feel, flexural-endurance, water-repellancy and fungus resistance together with wet and dry rub resistance (E.T., 14.3.78).

4.4 Bricks from Flyash - Using the know-how developed by Central Fuel Research Institute, Dhanbad, Paritosh Maji, Dy Director, Asansol Satellite Township Project, has

succeeded in manufacturing bricks from powerhouse flyash.

The machinery and equipment for the project include an electric-driven press machine, a mixer plant and a steam road roller.

The main raw material, flyash is procured from the powerhouse of the Durgapur Projects Ltd. Other raw materials, lime, sand, etc. are procured from the local market.

Maji has prepared a plan for producing 20,000 bricks/day, which will provide employment to 100 persons. The project, including the cost of land, will cost Rs 14 lakhs. The price of flyash bricks will be comparable to clay bricks and will open up the avenue of utilization of a waste product (Engng Times, 30.3.88).

2.4.5 Soyabean Complex - Britannia Biscuit Company Ltd, proposes to set up a Rs 2.5 crore integrated soyabean complex, the first of its kind, to produce a variety of high protein foods. The project will be implemented in three phases.

The site has not yet been finalized. The company has suggested alternative locations, including those in Madhya Pradesh and Maharashtra.

In the first phase, the company will produce soyabean flour and oil. In the next stages, it will

manufacture other soya-based products like solvent extracts and protein isolates.

To begin with, it will have a processing capacity of 100 tonnes of beans daily.

The directors said this food will be so formulated as to suit Indian conditions. These products also have a good export market (F.E., 20.1.78).

.4.6 <u>Liquid Jaggery</u> - The enquiry to supply 10,000 tonnes of jaggery to New York is under consideration. It has been decided to export jaggery after canning liquid jaggery in tins. The Central Food Technological Research Institute, Mysore, is ascertaining the nutrient content of the product.

Work is also underway to convert 70^{o} Brix syrup of jaggery into powdered form by a spraying method. If this experiment is successful, efforts will be made for export of powdered jaggery also [*Jagriti*, 1977, 21(22), 5].

3. ANNOUNCEMENTS

3.1 AWARDS

3.1.1 Leipzig Trade Fair - India has won a gold medal at this Fair for the quality of its products. The other countries to win gold medals at this bi-yearly Fair are Japan, Vietnam and the Philippines.

3.1.2 Vividhlaxmi Audyogik Samshodhan Vikas Kendra, a multi-purpose centre devoted to industrial research promotion, has awarded gold medals to 11 scientists for their work in the fields of metallurgy, mechanical engineering, agriculture and electronics.

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3.2 TRAINING

3.2.1 The Indian Institute of Management, Bangalore, is offering the following management development programmes during June, 1978.

Purchasing Management (5-10 June, Hotel Moghul, Agra).

Programme Highlights: The industrial purchasing behaviour in India; procedures, forms and records for purchasing; selection and evaluation of suppliers; make or buy decisions; import purchasing; purchasing research; value analysis and standardization; purchase of capital

equipments; Purchasing, inventory and materials management; Purchasing budgets; ethics of purchasing; legal aspects of purchasing; role of small scale/ancillary units in purchasing decisions.

Fee: Residential: Rs 2500/-. Non-residential: Rs 2000/-.

Marketing Productivity Analysis (19-23 June, Hotel Chola Madras).

Programme Highlights: marketing costs and profits by segments; marketing experiments for improving productivity of marketing variables; strategic marketing - market structure - appropriate strategy, information needs; personal selling - decision variables of sales manager and its relationship with out-put of personal selling effort; marketing research productivity - product launch, advertisement research, salesmen's effort, etc.

Fee: Residential: Rs 2000/-. Non-residential: Rs 1500/-.

The Management of Managers in Indian Organizations (19-25 June, Hotel Ashoka, Bangalore).

Programme Highlights: Identification and diagnosis of current and emergent problems inside managerial systems that impede organizational effectiveness; formulation of realistic guidelines for organizational action in respect of managerial communication motivation, compensation, training and development; Performance appraisal

and team-work; organizational and leadership designs and practices including MBO and the managerial grid; leadership behaviour, communication, conflict resolution styles, value systems and problem-solving approaches.

Fee: Residential: Rs 2200/-. Non-residential: Rs 1500/-.

Management of Power Systems (19 June to 1 July, Hotel East West, Bangalore).

Programme Highlights: organization management; planning and development; Financial management: materials management; maintenance management; personnel management; employee relations.

Fee: Residential: Rs 2300/-. Non-residential:Rs 1800/-.

Accounting for Management Control (26-30 June, Hotel Chola, Madras).

Programme Highlights: the settling of organizational objectives and their use; four keys to control: measurement and interpretation, selectivity, accountability and controllability; controls in the manufacturing operations; controls in marketing and selling operations; controls in the financial functions; management controls in use.

Fee: Residential:Rs 2500/-. Non-residential:Rs2000/-.

Futurology Workshop On Perspectives For India 2000 A.D: Planning and Management (12-16 June, West End Hotel, Bangalore).

Programme Highlights: role of futurology in planning and management; techniques for future analysis and harvey method of futures research; perspectives in India's future and sectoral scenarios; health, housing, energy, transportation, human settlements; marketing perspectives; managerial components in organization - future needs and scenarios.

Fee: Residential: Rs 1200/-. Non-residential: Rs 950/-.

For further particulars and nomination forms, please write to the Administrative Officer: (MCS), Indian Institute of Management, 33 Langford Road, Bangalore-560 027.

.2 The Plastics & Rubber Institute, Madras, will hold an intensive lecture course from 8 to 13 May, 1978, at Madras. The lectures will cover the syllabus for LPRI examination of The Plastics and Rubber Institute, London.

Fee: Rs 150 for members of PRI and Rs 200 for non-members. Drafts should be sent in favour of the Plastics & Rubber Institute Indian Section-Rubber, Madras Branch to: K.J.Janakar, Hony Secy, PRI (Rubber, c/o Bayer (India) Ltd, 150-B Mount Road, Madras 600002.

Last date for application: 30 April, 1978.

* * * *

3.3 PUBLICATIONS RECOMMENDED

3.3.1 Electronics for You, Annual number 1978, New Delhi, Price Rs 20.

This issue, besides carrying some interesting articles by eminent experts in the field, contains a comprehensive article on 'Electronics Industry in India' by R.M. Nayar. This article gives a clear picture of country's progress through the years on electronics component and equipment manufacturing. Another article, Electronics in Rural Economy, by B.K. Rai states how profitably electronics industry can thrive in rural areas in our country with less capital outlay and electrical power, and more employment.

There is also a list of electronics manufacturers arranged in alphabetical order. A Buyer's Guide is also presented separately for easy reference (Hindu, 14.3.78).

3.3.2 Bio-Gas Systems in Asia, by S.K. Subramanian; Management Development Institute, F-4 NDSE (Part I) New Delhi-110049, Pp 146, Price Rs 25.

This publication deals with a study of the various technological, social and economic aspects of the introduction of bio-gas plants in rural areas of Asian countries. It is based on the author's visits to over 70 bio-gas establishments in different parts of India (F.E., 12.3.78).

3.3 Employment Potential of Manufacturing Industries : A case study of Uttar Pradesh, by K. Prasad and T.V.S. Ramamohan Rao, Sterling Publishers Pvt. Ltd, New Delhi, Price Rs 35.

This publication deals with the methodology of measurement of employment potential of manufacturing industries. It also gives the results of survey of employment potential of large and small scale firms located in Uttar Pradesh.

The author has also analysed the data collected through the statistical and economic techniques (B.S., 26.3.78).

* * * *

ICAR Golden Jubilee

The Indian Council of Agricultural Research has planned to celebrate its golden jubilee in July 1978. The various research institutes under the Council will present well-tested and economically viable technologies for the farming community. As a part of the celebrations, the Council will organize an international symposium which will deal with the transfer of technology from the research farm to the farmer's field as well as organization and management of agricultural research and education.

At the same time, the International Federation of Agricultural Research will hold its first convention in India.

Vol. 1 No. 5 May 1978

INDUSTRIAL NEWS DIGEST

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PUBLICATIONS & INFORMATION DIRECTORATE, CSIR
Hillside Road, New Delhi-110012

INDUSTRIAL NEWS DIGEST

Vol.1, No.5, May 1978

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Industrial News Digest is a monthly bulletin issued by the publications & Information Directorate. A part of the newly-formed Industrial Information service of the Directorate, the Digest aims at providing packaged, down-to-earth technological and techno-economic information to industrialists, prospective entrepreneurs, and experts in both government and private agencies dealing with the management and planning of industry. Queries on technical and techno-economic matters are welcome.

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Publications & Information Directorate
CSIR, Hillside Road, New Delhi 110012

Abbreviations Used

1. B.S. – Business Standard
2. E.T. – Economic Times
3. F.E. – Financial Express
4. H.T. – Hindustan Times

[illegible] are used in the case of all scientific and industrial periodicals.

1. INDUSTRY PROFILE

REFRACTORY INDUSTRY

Materials with a marked resistance to high temperatures are termed refractories. They are essential to all industries based on heat operations. The major use of refractories is in the iron and steel industry; the balance of their consumption is in cement, lime, glass, potteries, chemicals, non-ferrous metals and other miscellaneous industries. Two of their recent applications are in nuclear and space research programmes.

It is not definitely known when refractories were first produced in India. However, certain heat-resisting materials were used in ancient metal industries. The first refractory plant was stablished in 1874 at Raniganj (W.B.) by Burn & Co. Ltd.

Raw Materials and Machinery

Refractories are made of different materials with widely varying properties suitable for a variety of purposes. High melting point and high mechanical strength are two necessary qualities of any refractory. In addition, according to their use, refractories should have resistance to acids, alkalis, other corrosive liquids, and abrasion. Refractories may be categorized into basic materials which are required to form refractory bricks

and shapes, and auxiliary materials like binders and fuels which help in the shaping and firing of refractories.

The basic raw materials are fireclay, bauxite, diaspore, sillimanite, kyanite, magnesite, chromite, dolomite, dunites (magnesia-rich rocks), quartzites and other silica rocks, mica, carbon and graphite, zircon, and silicon carbide. Refractories required for space programmes are made from pure metals and fibres derived from both metallic and non-metallic materials. The refractory metals are beryllium, tantalum, and niobium, while the fibres are produced mostly from silica and alumina.

All the principal raw materials required for the production of refractories are available in the country. Some, like fireclay, bauxite, sillimanite, kyanite, quartzite, magnesite, and dolomite are found in abundance, while chromite and graphite are less plentiful and their shortage is met by imports. The refractory metals are not available in India.

A number of equipments for batch handling, fabrication of bricks and firing are available locally. The industry in collaboration with engineering units has been able to design and develop processing machinery such as crushers, grinders, screening equipment, friction screw presses and hydraulic presses of medium tonnage. The sophisticated high duty presses are presently being imported. The

design and trial for heavy duty presses are being taken up by leading engineering units.

Present Status

The industry is presently in a position to manufacture and, in fact, is regularly supplying low grog and high grog fireclay refractories: high alumina refractories, heat insulating and acid-proof refractories; graphite nozzles and stoppers; coke oven silica bricks, chemically bonded and burnt basic bricks, dead burnt magnesite, electrocast refractories, silicon carbide and zircon based refractories.

At present, there are 84 refractory units in India operating both in organized (54 units) and small scale sectors (30 units), with a total capacity of 15 lakh tonnes. Bihar is the leading State having as many as 18 factories, followed by West Bengal, Tamil Nadu, Madhya Pradesh, Uttar Pradesh and Orissa. However, about 14 units, mainly in the small scale and medium sectors, are lying closed and atleast 4 or 5 others are not functioning properly.

The break up of capacity (lakh tonnes) terms of major categories is: (i) fireclay refractories, 10.15; (ii) silica refractories, 1.1; (iii) basic refractories, 1.2; and (iv) other refractories (including mortars, castables, dead burnt magnesite), electrocast, zircon and silicon carbide based etc., 2.5.

TABLE 1 - PRODUCTION OF REFRACTORIES
(In lakh tonnes)

	Fireclay/high alumina	Silica	Basic
1974	4.40	0.81	0.80
1975	4.43	0.60	1.08
1976	4.90	0.60	1.10
1977*	4.34	0.53	1.17

*Estimated

Production

Figures for the production of principal categories of refractories from 1974 to 1977 are given in Table 1. The total production went up to 6.6 lakh tonnes in 1976 from 6.01 lakh tonnes in 1974. However, in 1977 it again came down to 6.04 lakh tonnes. The out_put of fireclay/high alumina refractories has been more or less steady, being about 4.4 lakh tonnes in 1974 and 4.34 lakh tonnes in 1977. Over the same period there has been a remarkable rise in the production of basic refractories from 0.80 to 1.17 lakh tonnes. The production of silica refractories, however, declined from 0.81 to 0.53 lakh tonnes during the same period.

It is believed that the production capacity in the country is sufficient to meet the present and foreseeable

future requirements. Nonetheless, new refractory projects are approved not necessarily to augment production of the general run of refractories but for manufacturing newer varieties of refractories or for bridging the gap between production and demand of some particular types.

Consumption Pattern and Demand - Development of the refractory industry is closely linked with the iron and steel industry. Accordingly, changes in steel technology have a major bearing on the development of this industry. In this connection, the notable changes were from silica to all-basic roof construction in open hearth furnaces (accounting for 85% of ingot steel production in India at present), the use of chemically bonded basic bricks and the switch over to high alumina refractories, and adaptation of LD process for steel making, which started from 1959 at Rourkela Steel Plant. At present the LD process accounts for 15% for steel production. This has led the refractory industry to diversify and improve quality which, coupled with better operational techniques in steel plants, have substantially reduced the consumption of refractories from about 100 kg/tonne of steel in the mid-fifties to about 35 kg/tonne of steel by the early seventies.

At present, consumption norms (in kg/tonne of steel) for fireclay refractories, silica bricks, and basic

bricks are 25, 0.17 and 2.68 respectively. Corresponding consumption norms on refractories for the aluminium industry is about 16 kg/tonne of fireclay refractories and 4.5 kg/tonne of high alumina refractories. In the cement industry, also one of the major users, the consumption of fireclay bricks is 0.4 kg/tonne of cement and that of high alumina refractories about 0.2 kg/tonne of cement.

Constraints

As stated earlier, the refractory industry is not running very smoothly. The reasons are multifarious, and originate from factors both within the refractory units as well as exogenous. For instance, out of 190 electric furnace units with a registered capacity of over 0.4 lakh tonnes, only about 80 are said to be in operation. Further, due to acute power shortage, a significant portion of demand originating from the mini-steel units is likely to be stagnant for the foreseeable future.

The recurring power shortage all over the country, particularly acute in south India and the Bengal-Bihar belt, has also an adverse effect on refractory production.

As mentioned earlier, there has been a decline in the consumption of refractory in the steel industry which will be compounded by the introduction of LD process. For, the consumption of refractories per tonne of steel by the

LD process is only about 4 kg as against 30-35 kg for the open hearth process.

In addition, lack of clear-cut purchase policy and advance planning are the major hurdles in the growth of the industry.

R & D and Import Substitution

The refractory industry seems to be conscious of the importance of R & D. Incentive is given for setting up R & D facilities for planning and developing newer varieties of refractories to cater to the ever changing requirements of the consuming industries. However, support and cooperation of the consumers and governmental encouragement to the R & D effort, specially by suitable restrictions on imports, are needed.

The significant development programmes already implemented include production of sophisticated products like high alumina cement and mortars (over 70% alumina), silicon carbide tubes and nozzles, zircon-alumina refractories, electrocast refractories, bloating type fireclay nozzles, clay graphite and clay magnesite nozzles, high grade zircon refractories and slide gate systems. Besides, it goes to the credit of the industry that they have been successfully meeting the constructional and operational requirements of the integrated steel plants.

However, the development of following new products is desirable: monoliths, high alumina refractories, coke oven silica bricks, electrocast refractories, hot face insulation, tar-impregnated basic refractories, alumina and zirconia, special ramming masses, super refractories and other speciality products which are in short supply.

The important R & D institutes engaged in research on refractory raw materials, the development of refractories and their applications are: National Metallurgical Laboratory, Jamshedpur, Central Glass & Ceramics Research Institute, Calcutta, and Regional Research Laboratory, Bhubaneswar. Technical consultancy in the field is mainly offered through the Metallurgical & Engineering Consultants Ltd and the National Industrial Development Corporation.

The emphasis during the last several years in the development of the refractory industry has been toward import substitution and production of new items. In this direction, the record of the industry is creditable, as is evident from the sharp declin in imports.

Exports

Exports of refractories are limited to a few thousand tonnes. Table 2 presents category-wise details of exports of refractories for the last three years. It can be seen that exports have been picking up, though slowly. The

TABLE 2 - EXPORTS OF REFRACTORIES
(Qty in tonnes; val. in lakh Rs)

	1974-75		1975-76		1976-77	
	Qty	Val	Qty	Val	Qty	Val
Heat insulating bricks and shapes	354	4.69	78	0.76	20	0.18
Fireclay bricks and shapes	5,735	46.73	10,481	112.46	9,739	126.99
Silica bricks and shapes	2	4625*	805	8.46	165	2.29
Magnesite bricks and shapes	1,123	9.67	75	1.55	7	0.13
Chrome bricks and shapes	-	-	-	-	1,517	37.47
Chromemagnesite bricks and shapes	704	10.30	2,830	40.19	962	12.52
Magnesitechrome bricks and shapes	404	5.77	75	1.13	1,786	39.79
High alumina bricks and shapes	644	6.10	16	0.13	231	3.61
Siliconcarbide bricks and shapes	44	0.97	2	8,300*	29	1.5
Other refractory bricks and shapes	62	0.92	2.32	4.67	168	3.16
Refractory cement	102.057	4.63	183.66	13.93	15.04	0.33

*In Rs.

major export items are fireclay bricks and shapes. Not only have their exports been increasing consistently but their share in the total exports has also gone up. The

other important refractories appearing in the export list include chromemagnesite bricks and shapes, magnesitechrome bricks and shapes and high alumina bricks and shapes.

The industry has been able to gain a foothold in the overseas markets in west Asia, south-east Asia and the Far East. The major markets of Indian refractories are Iran, Bangladesh and Egypt.

Imports

Imports of refractories in recent years have been confined mainly to highly specialized types, which are either not being manufactured or their production is much less than the country's demand. Imports figures for 1974/75 - 1976/77 are given in Table 3. Imports of many items have gone down over this period. Quantity-wise, the two major refractories, namely, silica bricks and shapes and firebricks and shapes, constitute the bulk of the total refractory imports. USSR has consistently been the largest supplier of refractories followed by UK and West Germany. However, their ranking differ somewhat from year to year.

TABLE 3 - IMPORTS OF REFRACTORIES
(Qty in tonnes;val. in lakh Rs)

	1974-75		1975-76		1976-77	
	Qty	Val	Qty	Val	Qty	Val
Heat insulating bricks and shapes	11	0.69	3,352	84.81	2,720	90.69
Fireclay bricks and shapes	1,636	24.06	3,664	83.78	1,230	20.54
Silica bricks and shapes	1,494	29.24	123	1.24	81	0.84
Magnesite bricks and shapes	-	-	340	10.95	-	-
Chromemagnesite bricks and shapes	-	-	1,248	29.22	675	28.45
Magnesitechrome bricks and shapes	114	3.0	12	1.33	-	-
High alumina bricks and shapes	50	4.24	-	-	1	0.17
Graphite bricks and shapes	10	0.57	59	6.61	17	1.84
Silicone carbide bricks and shapes	9	0.95	-	-	-	-
Other refractories bricks and shapes	1,458	29.45	1,189	38.29	189	14.35
Refractory cement bricks and shapes	245.24	56.78	320.05	8.84	250.69	13.94

[Source : Wlth - Ind. Prod., VII, 190, 191, 203; Guidelines for Industries 1976-77, 342-43; Industr. res., 1976, 3(2),75; Refractory Industry in India, Directory-cum-Mannual 1978, 6-10; Information from the Directorate General of Technical Development, New Delhi].

2. INDUSTRIAL NEWS

2.1 GENERAL

2.1.1 Public Sector - This sector of the Indian industry seems to have finally come of age. In 1977-78 the capacity utilization of the sector has shown distinct improvement in many key areas. Production of ingot steel during April-September 1977 went up to 2.88 million tonnes as compared to 2.73 million tonnes during the same period in the previous year. In the same period in 1977 through-put of petroleum was 11.96 million tonnes (11.11 million tonnes in 1976); production of petrochemicals (DMT) was 13.2 thousand tonnes (12.4 thousand tonnes in 1976); production of cement 1,81,000 tonnes (1,64,000 tonnes in 1976); and production of fertilizers was 3,60,000 tonnes (N 3,40,000 tonnes in 1976) without including figures of Namrup expansion, Barauni and Cochin II for comparability.

Capacity utilization for fertilizer went up to 60 per cent in April-September 1977 as compared to 57.5 per cent during the same period in 1976 (not including Namrup expansion, Barauni and Cochin II for comparability).

During the five years of the Fourth Plan, the public sector enterprises generated gross internal resources of the order of Rs 12,600 million achieving 99.6 per cent of the target and during the three years of the

Fifth Plan the actual achievement was Rs 18,250 million achieving 113 per cent of the target. The amount contributed by the public enterprises to the Central exchequer was Rs 31,200 million during the five years of the Fourth Plan and Rs 40,950 million during the three years of the Fifth Plan.

The investment of the public enterprises rose from Rs 55,710 million in 1972-73 to Rs 110,970 million in 1976-77; the turn-over rose from Rs 52,990 million to Rs 145,420 million, gross profits (before interest and tax) from Rs 2,450 million to Rs 1,05,540 million, and net profit (before tax) from Rs 830 million to Rs 4,760 million. The return on capital employed which was 5.1 per cent in 1972-73 shot up to 9.7 per cent in 1976-77. Similarly, return on paid-up capital rose from 0.6 per cent to 4.6 per cent in 1976-77.

Public enterprises also earned foreign exchange through export of goods and trading. In 1976-77 a sum of Rs 22,480.6 million was earned in foreign exchange as against 15,358.? million in the previous year [Econ. commerc. News, 1978, 8(12), 8].

.1.2 Joint Ventures - The Commerce Minister Shri Mohan Dharia has emphasized that the Government would encourage setting up of joint ventures abroad as "symbols of friendship". The Cabinet Committee on Exports would

have the final say on according approval for setting up such ventures. The Government would continue its efforts to set up Indian projects in developing countries. However, these projects must help the countries in which they are set up to expand their industrial and infrastructural base for their own development.

An important observation of Mr Dharia was that as far as turn-key projects are concerned African and south and south-east Asian countries provide better scope than the oil-rich countries which have a tendency to acquire very sophisticated plants and equipments (Engng Times, 6.4.78).

2.1.3 Cottage Industry - The Punjab government has drawn up a comprehensive plan to set up 4,000 cottage industrial units distributed over more than 1,000 villages, during 1978-79. The project will cost Rs 180 lakhs and can provide employment for about 12,000 persons. New entrepreneurs will be provided with a package of incentives for setting up such cottage units which would help in development of rural areas. The State government would finance Rs 50 lakh and and Punjab Khadi and Village Industries Commission will provide the balance, as loan and grant for disbursement to the entrepreneurs (E.T., 25.3.78).

*   *   *   *

2 ENGINEERING INDUSTRY

2.1 Seamless Steel Tube - The Bharat Heavy Electricals Ltd (BHEL) has installed a plant for manufacturing seamless steel tubes suitable for use in high pressure boilers. Production will start from 1979 and the full capacity of 40,000 tonnes/yr is expected to be reached in 3 years. The tubes produced by the plant will have outer diameters between 14 and 159 mm with a maximum wall thickness of 12.5 mm.

The demand for seamless steel tubes is expected to reach 175,000 tonnes/yr by the end of VI Plan. Out of this demand, the requirement for boilers should be about 65,000 tonnes [Chem. petrochem. J., 1977, 8(5), 29].

2.2 New Mini-tractor - Two British Companies, Barfords and Industrial Engineering Sales, have designed a mini-tractor (Buffalo) suitable for developing countries.

The tractor will have a three-speed gear box, providing a top speed of about 18 km/hr, through a 10.5 h.p. single cylinder aircooled diesel engine. Fuel consumption will be about 2.25 l/hr and fuel tank capacity about 55 l. The tractor will be about 2.5 m long, 1.3 m wide, and will weigh about 800 kg. It will be capable of covering rough terrains. The cost will be about Rs 23,000 (Hindu, 10.4.78).

WORLD STEEL OUTPUT

World crude steel production in 1977 was 673.1 million tonnes - a decrease of 0.5% compared to the 1976 figure of 676.5 million tonnes. In 1974 there was a record production of 708.8 million tonnes.

In 1977 India recorded a 6.8% rise in steel production (10 million tonnes in 1977 against 9.36 million tonnes in 1976) and was ranked 16th in the world. The first 8 countries (1977 production in million tonnes within parentheses) were: USSR (147), USA (113.1), Japan (102.4), FRG (39), China (23.4), Italy (23.3), France (22.1) and UK (20.4).

The above figures are preliminary estimates compiled by the International Iron and Steel Institute.

2.2.3 Portable Rice Bran Stabilizer - A hand operated portable rice bran stabilizer has been fabricated by the Oil Technological Research Institute, Ananthapur, Andhra Pradesh. It is suitable for small to medium scale rice mills and can be suitably scaled up to suit big modern mills also.

The stabilizer consists of galvanized iron drum, with a door and a hole for the thermometer, revolving on a lever. Beneath the drum is a perforated sheet for

heating with firewood, charcoal, rice husk or groundnut shells. At one end there is a vent for exhaust gases. The capacity of this unit is 70 kg of bran/batch and it weighs 85 kg.

Fresh rice bran is heated in the rotating drum for 30-60 minutes at 90-105°C. The stabilized bran is discharged through the feeding door. It is found that the free fatty acid (FFA) content of the stabilized bran rose from the initial value of 2% to only 4% in 7 days, whereas in unstabilized bran it rose to 20%. The oil extracted from the stabilized bran can be refined and bleached by conventional methods to acceptable ISI standards. The cost of the unit is Rs 500 (Hindu, 20.3.78).

.2.4 Aero Engine Power Generator - As early as 1959 itself, the Rolls Royce, England, has built a power station, powered by a compact aero type gas turbine. Such power stations have been established in 48 countries. Now a new Rolls Royce 593 engine, capable of producing 50 MW of electricity has been designed by Concorde, the Anglo-French supersonic aircraft manufacturers. This 3 ton engine can produce electricity to suit the power needs of a town of moderate size of 50,000 people. This engine can produce 75% more power than the earlier Rolls Royce industrial gas turbine. It will be economical, powerful and compact.

Rolls Royce will produce this 593 engine as a power unit for a range of their own manufactured power stations. These sets will be easily transportable and are designed as single engine or twin engine capable of generating 50 or 100 MW of electricity. Further, the sets will be designed for incorporation into combined cycle generating plant, operating in conjunction with steam turbines, thereby increasing the output to 65 MW single engined set.

The Industrial Rolls Royce 593 engine will be manufactured at Bristol and packing of the engine and the associated power turbine into transportable power stations will be done at Coventry, England. The sets are expected to reach the markets by 1981 (Engng Times, 6.4. 78).

* * * *

2.3 CHEMICAL INDUSTRY

2.3.1 Advisory Body - An advisory committee on chemicals and fertilizers industry has been set up for the development and growth of this industry with special reference to the need for wider dispersal of the units and promotion of rural development. The committee will render useful assistance to the government in identifying problems and suggesting measures for the balanced growth of the industry. Besides, it would also review the status of indigenous technology development and suggest measures for combating environmental pollution and prevention of sickness

in the industry.

The committee will comprise members from ministries and government departments, industry and academic institutions (H.T., 12.4.78).

2.3.2 New Fertilizer Plants - A 2.36 lakh tonnes capacity fertilizer plant at Bhatinda (Punjab), is now poised for trial runs. This project, implemented by the National Fertilizers Ltd (NFL), is expecting the arrival of the feedstocks, raw materials, etc. to begin trial runs shortly.

NFL has completed another identical capacity plant at Panipat which will start trial production by the middle of this year.

The above two fertilizer plants have been engineered by the Engineers India Ltd (EIL) in technical collaboration with the Toy Engineering Corporation, Japan.

While designing the two units, special care has been taken to prevent environmental pollution. Dust filters have been provided for urea prilling section and electrostatic precipitators for the boilers. There is also provision for recovery of sulphur from effluent gases to reduce air contamination to the minimum. Waste water from the plant would also be adequately treated to prevent any pollution.

Together, the two plants would produce 4.72 lakh tonnes of nitrogen, saving the country about Rs 120 crores in foreign exchange at the prevailing international prices [Econ. commerc. News, 1978, 8(14), 9].

2.3.3 Dimethyl Terephthalate - DMT is a petrochemical intermediate used for manufacturing polyester fibre and polyester filament yarn. It has been manufactured by the Indian Petrochemicals Corpn Ltd (IPCL) at its Aromatic Project, Koyali (Gujarat), which went into partial production in 1973. Earlier, the demand for DMT was totally being met by imports.

IPCL has achieved a peak production of 25,556 tonnes (valued at Rs 28.24 crores) of DMT for the second successive year in 1977-78. This is 106.5% of the installed capacity (24,000 tonnes) of the plant.

The production of xylenes during 1977-78 also rose to 33,080 tonnes, representing 81.7% of the installed capacity. This is the maximum production obtainable with the xylenes precursors content in the naphtha currently available (Wealth India - Ind. Prod., VIII, 237; E.T., 11.4.78).

2.3.4 New Drug Unit - The first joint sector project with the participation of the Hindustan Antibiotics, Pimpri, will come up in Bangalore to manufacture a range of

antibiotics and other chemo-therapeautic drugs. The size of the project and the working arrangement are yet to be decided.

To start with, it will be a formulation unit which is expected to go on stream during 1980. This unit will produce some of the drugs for the first time in the country and is expected to meet the total requirement of southern states (E.T., 12.3.78).

* * * *

MISCELLANEOUS INDUSTRIES

-.1 Solvent Extraction Plant - Assam Hills Small Industries Development Corporation has set up a solvent extraction plant (costing Rs 21 lakhs) to produce oil from rice bran at Hawraghat in Karbi Anglong district.

The unit, with an installed capacity of 10 tonnes/day will go into production next year (E.T., 17.3.78).

-.2 Saraf Paper Mills - The Saraf Group of Industries has planned to set up a Rs 3.5 crore paper project (cap. 10,000 tonnes/yr) at Alwar, a backward area of Rajasthan. This will be the first paper mill in Rajasthan, and is expected to go into production in April, 1979.

The raw materials required for manufacturing writing and printing paper will be agrowaste (H.T., 11.4.78).

2.4.3 Improved Pottery Technology - The pottery industry is undergoing a silent revolution with the introduction of improved technology. The traditional potters' wheel is being replaced by an improved one fitted with ball bearings and operated by electricity. A distinct advantage of the power operated wheel is increased production, resulting in higher earnings for the potter. It also facilitates the production of jars and pipes of any size. Similarly, improved kilns have also been introduced at various places to produce bricks and tiles. All these improvements have been introduced by the Khadi and Village Industries Commission [Jagriti, 1978, 22(9), 7].

2.4.4 Shoes - South East Footwear Ltd, an Indo-Italian venture, has set up a Rs 2 crore automatic export oriented plant at Ambur near Madras to manufacture highly sophisticated and fashionable shoes.

The company has a licence to manufacture 4.32 lakh pairs of shoes/yr with a condition to export 75% of the production for a period of 5 years. The company has already exported shoe uppers worth Rs 9 lakhs and has on hand export orders worth Rs 30 lakhs for execution during the next three months (H.T., 5.3.78).

2.4.5 Mini Cement Plants - A technology for setting up mini cement plant, based on vertical shaft kilns, has been

developed by the Cement Research Institute (CRI), New Delhi, using a semi-dry process.

Mini plants are proposed to be installed by the Government of India, at 43 potential sites in 19 states. The following are the break-up figures of sites in different states: Andhra Pradesh (4), Meghalaya (3), Bihar (3), Jammu and Kashmir (3), Karnataka (3), Madhya Pradesh (3), Rajasthan (3), Tamil Nadu (3), Manipur (2), Gujarat (2), Himachal Pradesh (2), Kerala (2), Maharashtra (2), Orissa (2), and West Bengal (2). Arunachal Pradesh, Assam, Nagaland and Uttar Pradesh will have one site each [Econ. commerc. News, 1978, 8(14), 9.].

3. ANNOUNCEMENTS

3.1 AWARDS

3.1.1 Top-Exporter Award for 1976-77 – Indian Dyestuff Industries Ltd has won the top-exporter award of the Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council.

3.1.2 Export Award – Engineering Export Promotion Council has awarded Universal Cables Ltd a special award for their excellent export.

3.1.3 Oil Technological Association of India's Gold Medal for 1977 has been given to Dr S.D. Thirumala Rao, Director, the Oil Technological Research Institute, Anantapur, Andhra Pradesh for his contribution to the oil and oil-based industry.

Dr Rao et al have also won the Prag Narain Memorial Award for 1977 for their best project report "Industrial Recovery of Lecithin from Oilsludges".

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3.2 TRAINING

3.2.1 The Central Electrochemical Research Institute, Karaikudi, has organized three short-term refresher courses on: (i) electroplating; (ii) corrosion and its prevention, and

(iii) storage battery technology, during June-November 1978.

Further details can be obtained from : The Director, Central Electrochemical Research Institute, Karaikudi - 623006.

2.2 Administrative Management Programme in R & D - A ten-day training programme on Administrative Management for senior and middle-level administrative personnel from the administrative wings of the national laboratories, organized by the Management Unit of CSIR's Planning Division, will be held at the National Chemical Laboratory, Poona, from May 25, 1978.

Further details can be obtained from: Shri S.R. Vasist, Training Officer, Management Development Unit, Planning Division, CSIR, Rafi Marg, New Delhi - 110001.

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3 PUBLICATIONS RECOMMENDED

3.1 Farm Bulletin on Medicinal and Aromatic Plants - The Central Indian Medicinal Plants Organization, Lucknow, has published nine farm bulletins on important medicinal and aromatic plants, in popular languages for the benefit of progressive farmers, entrepreneurs and those interested in taking up large scale cultivation. The bulletins give complete agro-technology and economics of cultivation on

different plants (CSIR News, 30.3.78).

3.3.2 Influence of Calcium Chloride Admixture on Reinforcement Corrosin in concretes, Cement Research Institute of India, M-10 South Extension II, New Delhi - 110049.

This is a report brought out by the Cement Research Institute of India (CRI), New Delhi, and contains the findings of the investigation made at the institute on the use of calcium caloride as admixture for accelerating setting and hardening of concretes. However, because of the advantages of calcium chloride as an accelerator in winter concreting, as also in precast concrete jobs enabling quicker release of moulds and in fly ash cement concretes for early strength development, the institute studied the role of the compound vis-a-vis reinforcement corrosion, and determined the safe limits of its addition to concrete (CSIR News, 30.3.78).

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3.4 FAIRS

3.4.1 An International Fair will be held in Lisbon (Portugal) from June 1-10, 1978. The main items at the fair will be electronics, mechanical goods, engineering goods (household appliances), civil construction, plastics, drugs and pharmaceuticals.

Interested participants can contact : Secretariado Dat Fil, Feira International De Lisboa (DC), Praca Das Industrias, Lisboa 3, Portugal under advice to Mr Pramod Kumar, First Secretary, Embassy of India, Lisbon(Portugal).

.4.2 Trade Fairs in Austria - Following international trade fairs will be held at Salzburg in Austria. Date and the name of fiar along with the products in parenthesis are given in the following table.

Date	Name of the Trade Fair
May 26-28	10th International Trade Fair (Watches, jewels, jewellery, machinery, tools, accessorias, shop equipment and display)
Sept 15-17	31st International Trade Fair (sports goods, sports equipment, sports fashion) International Trade Fair (footwear, leather goods, accessories)
Sept 22-24	16th International Trade Fair (souvenirs, arts and crafts, decorating implements, smoking requisities, florists requisities, PR-gifts, nursery furnishing, prams, toys) 10th International Trade Fair (tableware, chinaware, glassware, cutlery, metalware, decorating implements, accessories, little furniture)

Further details can be obtained from: Fachmessen Slazburg, Gas m.b.H. & Co., KG, A-5021, Postfach 285, Sudtiroler platz-11, Bundeslanderhans.

*   *   *   *

3.5 SEMINAR

The Coimbatore Regional Centre of the Coimbatore Institute of Technology has organized a seminar on 'Role of Chemical Engineers in Rural Development' on August 4-5, 1978 at Coimbatore.

The highlights of the seminar will be: (i) utilization of agricultural products (including agricultural wastes); (ii) rural industrialization and environmental pollution, (iii) industrial engineering applied to small scale industries.

Further details can be obtained from: Dr V Subramaniyam Honorary Secretary, I.I.ch.E., Coimbatore Regional Centre, Coimbatore Institute of Technology, Coimbatore - 641014.

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INDUSTRIAL NEWS DIGEST

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PUBLICATIONS & INFORMATION DIRECTORATE, CSIR
Hillside Road, New Delhi-110012

INDUSTRIAL NEWS DIGEST

Vol.1, No.6, June 1978

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Industrial News Digest is a monthly bulletin issued by the Publications & Information Directorate. A part of the newly-formed Industrial Information Service of the Directorate, the Digest aims at providing packaged, down-to-earth technological and techno-economic information to industrialists, prospective entrepreneurs, and experts in both government and private agencies dealing with the management and planning of industry. Queries on technical and techno-economic matters are welcome.

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Publications & Information Directorate
CSIR, Hillside Road, New Delhi 110012

Abbreviations used

1. B.S.	-	Business Standard
2. E.T.	-	Economic Times
3. F.E.	-	Financial Express
4. H.T.	=	Hindustan Times

Standard abbreviations are used in the case of all scientific and industrial periodicals.

1. INDUSTRY PROFILE

INDUSTRIAL ALCOHOL

Ethyl alcohol is one of the oldest known industrial solvents. Besides its major use as a beverage, alcohol has for many centuries been used in the preparation of medicines perfumes and cosmetics. During the last hundred years it has come to be used also as a fuel and an important raw material.

As a solvent alcohol is used in lacquers, varnishes, enamels, plastics, explosives, toilet preparations, pharmaceutical products and in the processing of industrial food and drug products.

It is a key raw material in the manufacture of other chemicals such as acetaldehyde, ethyl acetate, acetic acid, ethylene dibromide, ethers, and ethyl chloride. Other uses of alcohol are in medicines, flavours and flavouring extracts, antifreeze, etc.

The importance of alcohol is brought more sharply into focus during wartime since this versatile material is essential in the production of explosives notably smokeless powder, chemical warfare gases, antifreeze, and such synthetic rubber and plastic products as butadiene and styrene. With the advent and widespread use of the automobile, extensive experimentation has been carried as far adopting alcohol as a motor fuel.

The establishment of the industrial alcohol industry in India was rather haphazard during the early stages. The industry was conceived as a source of supplementary motor fuel during the war years, and the entire approach to the establishment and organization of the industry between 1943 and 1955 was based on this objective.

Raw Materials

The chief raw materials are molasses, a byproduct of sugar industry, and to a small extent, sulphite waste liquor which are produced in appreciable quantities as a waste product of the sugar and paper industries. Mohua flowers and the juices of the palms constitute the chief natural raw materials which are mainly and directly fermentable.

Molasses - In sugar producing countries molasses is the ideal raw material for alcohol production, from the standpoints of cost and efficiency. Molasses is very rich in sugar (average 50%) and is readily fermentable without any pretreatment. Production figures of molasses for 1974-75, 1975-76, 1976-77 are 20.14, 17.02 and 20.59 lakh tonnes respectively.

Alternative sources - A cellulosic raw material of particular interest to sugar producing areas of India is bagasse, a sugar-industry waste, which is now employed mostly as fuel for generating power and steam for the sugar factories. Gur and Khandsari which may be in excess of food requirements may advantageously be utilized as raw materials.

However, use of cereal and starchy materials cannot be expected to meet industrial requirements as raw materials at least in the near future on account of their higher prices. Wood hydrolysates may also be considered as promising raw materials, but these are usually more expensive on account of the processing charges involved.

Because of its high cost of collection, its biological instability and its high potential value in human nutrition, palm juice can be regarded only as a possible source of alcohol during critical periods of emergency. Sulphite liquors are not of much direct interest to India at the moment since the pulp industry in India is comparatively small, and the process adopted in the country does not favour the production of fermentable sugars in the lye.

A promising source of alcohol appears to be sugar plantation on 100-200 acres with massive distilleries attached to these plantations. Sugarcane and sugar can be directly used for production of alcohol on a large scale.

<u>Present Status</u>

There are at present 120 distilleries with an installed capacity of over 60 crore litres compared to about 6 crore litres in 1946-47, which means a tenfold increase in three decades. Due to irregular supplies of coal, furnace oil, molasses and, ultimately, off-take of alcohol, the distilleries hardly work at 50% of their capacities. In spite of this, however, more

licences have been issued and it is likely that by 1980, there may be over 150 distilleries.

Production

With the increase in consumption of alcohol as feed-stock and raw material, its production has increased considerably. In 1974-75, the production of industrial and power alcohol in organized sector was 25.1 crore litres. It went up to 28 crore litres in 1975-76. In 1976-77 the total production went up to 44 crore litres (30 crores in organized sector) which exceeded the estimated target of 30 crore litres. It is expected that by 1984 it will go up to 60 crore litres.

In 1976-77, Uttar Pradesh (14) and Maharashtra (11) were the largest producers of alcohol followed by Andhra Pradesh (4.48), Karnataka (3.20), Tamil Nadu (3.05) and Bihar (1.95). Figures within paraentheses denote production in crore litres.

Production figures of both industrial and power alcoh in organized sector for the last three years are given in

TABLE 1 - PRODUCTION OF ALCOHOL
(Qty in crore litres)

1974-75	25.1
1975-76	28.0
1976-77	30.0*

*Estimated

Demand and Consumption

The country produced about 44 crore litres of alcohol during 1976-77, but the total quantum of alcohol allotted to the existing alcohol-based industries ranged between 24 and 26 crore litres, as against an estimated requirement of about 30 to 33 crore litres.

With the increase in number of alcohol-based industries, the requirement of alcohol has naturally increased. It is roughly estimated that by 1980 the alcohol-based industrial units would require 50 crore litres of alcohol and by 1984 about 60 crore litres. With the present sugar production of 44 crore tonnes and an expected production of 70 crore tonnes by 1982, there should be no difficulty in meeting the raw material requirement of alcohol-based industries.

The Swaminathan Committee, set up to make recommendations regarding present growth and future planning for alcohol-based industries, visualized that, assuming a minimum 10% growth rate was achieved by 1990, the requirement of alcohol for industrial purposes would be in the region of 85 crore litres.

The industry-wise requirements of alcohol (in crore litres) by 1990 are estimated as: organic chemicals and pesticides 78, pharmaceuticals 7.5, and paints and varnishing and other miscellaneous uses 12.5.

R & D

To overcome the shortage of alcohol during the lean sugar years and to meet the requirements of alcohol

deficit States, it is desirable to find out its alternative sources. Processes have been developed using mandioca, cassava and babacu nuts, tapioca and other starchy materials. Reeds from jute and similar plants have also been experimented upon. More R & D as well as pilot plant work is required to make these processes economically viable.

As per research carried out at the Indian Institute of Technology, New Delhi, ethanol produced from agricultural wastes can be blended with petrol and used for running vehicular and stationery engines.

Bagasse, which is being burnt at present in the furnaces of sugar factories as a waste material, can yield up to 17 lakh tonnes alcohol/yr. Alcohol extraction from bagasse can be achieved by saccharification and fermentation in accordance with a process developed and patented by K. Manivannam and N.R. Kuloor.

Exports

In 1974-75 there was no export of industrial alcohol. In 1975-76, India exported only one tonne of denatured ethyl alcohol to Nepal. In 1976-77, the amount rose to 7,090 tonnes, of which 2,899 tonnes was exported to Japan and 4,191 tonnes to Switzerland. The above trend clearly indicates the phenomenal growth of alcohol exports.

Imports

India buys industrial alcohol mainly from Japan and USA. Import figures of industrial alcohol for the

last three years are given in Table 2.

TABLE 2 - IMPORTS OF INDUSTRIAL ALCOHOL
(Qty in kg; val. in thousand Rs)

	Qty	Val.
1974-75	1,010	41.05
1975-76	866	31.71
1976-77	3,367	104.37

It can be seen from the table that in 1975-76 import of industrial alcohol came down to 866 kg from 1,010 kg in 1974-75. However, due to under utilization of capacity and increased consumption in various industries, there was a steep rise in its imports in 1976-77 to 3,367 kg.

Future Prospects

There is a likelihood of increase in the availability of molasses for the manufacture of alcohol with the considerable increase in sugar production and the coming up of new sugar factories in the country. In 1978-79, the incr increased availability of molasses is expected to result in an increased production of alcohol by at least 15 lakh tonnes over that produced in 1977-78. This quantity is expected to go up by a further 15 lakh tonnes at the end of the Sixth Plan [Rep. Seminar on the Production and Use of Power Alcohol in Asia and the Far-East, 1952, 146; Indian Sugar, 1977, 27(9), 497 & 644; E.T., 22.4.78; Chem. Weekly, 1978, 13 (15), 81; Guidelines for Industries 1976-77, 325].

P.D.Tyagi

2. INDUSTRIAL NEWS

2.1 GENERAL

2.1.1 Technology Package - At a get-together organized by the National Metallurgical Laboratory (NML) and the Indian Chamber of Commerce (ICC), Calcutta, Dr A. Ramachandran, Secretary, DST, and Director General, CSIR, stressed the need for delivery of packaged technology by R & D institutions to industrial entrepreneurs. However, Dr Ramachandran pointed out that such transfer of technology is difficult in developing countries where the entrepreneurs require sustained assistance from the blueprint to the operational stage of a project. He emphasized the importance of reaching the commercial exploitation stage of a process at the pilot plant level. To achieve this he felt that engineering and design organizations should join hands with laboratories.

Shri J.M. Jatia, President, ICC, said that national laboratories should know the problems arising from implementation of new techniques and ideas, so that they could orient their research in the right direction in helping the industry. Although the allocation of Rs 650 crores for the development of S & T is not large, Shri Jatia felt that, if spent judiciously, it may be sufficient to develop many new processes and products (Engng Times, 4.5.78).

2.1.2 Industrial Licences - The Ministry of industry has cleared most of the backlog of applications for industrial licence pending with it. According to the Annual Report of the Ministry for 1977-78, 1,545 new applications were received during the year. Out of these about 400 were rejected as unsound. Almost all of the rest were processed. The percentage of disposal of pending and new applications during the year was an impressive 98.

As regards foreign collaborations applications almost all new and old applications were suitably cleared. The main areas of foreign collaboration approved were: industrial machinery, electrical equipment, chemicals and transportation.

All capital goods cases, numbering 77, cleared. The value of capital goods approved by the Capital Goods Committee during 1977-78 was Rs 163.8 crores, including Rs 12.4 crores for export oriented cases [Econ. Commerc. News, 1978, 8 (18), 9].

2.2 ENGINEERING INDUSTRY

2.2.1 Industrial Fasteners - These are used in machine tools, shipbuilding, electronic transmission towers and power stations, general engineering, petrochemical, structural and building industries.

A study team set up by the Trade Development Authority has found that the Indian industrial fasteners

can command a good market in Denmark which imports 80% of its domestic demand for industrial fasteners. The team found that the Danish importers are not aware of the vast range of fasteners being manufacture in India.

As a remedy, the team has suggested various sales promotion measures such as: taking part in international fairs and exhibitions, inviting buyers' delegations, providing the fasteners in small and attractive packings, etc. [Foreign Tr. Bull., 1978, 8 (8), 14].

2.2.2 TIG Cutting Machine - Usually nonferrous metals and stainless steel sheets are cut by mechanical guillotin shears, bend saws, etc. Sometimes, cutting processes as TIG welding equipment and carbon-arc processes are also being used. But the main drawbacks of these processes are that, they consume more electrodes and are of limited value with low cutting speed and high labour cost.

The Central Mechanical Engineering Research Institute (CMERI), Durgapur, has developed a constricted TIG cutting machine. The constricted arc process produces high quality of cut at higher speeds. The new torch developed by CMERI for this purpose can cut alumini and copper up to 35 mm thickness and stainless steel up to 20 mm thickness. The thickness of the metal that can be cut is mainly limited with the availability of the power source. With imported power source much higher thickness than those given above can be cut.

This process supercedes other mechanical and arc cutting methods for nonferrous and stainless steels. The cut surface is free from dross and is very clean and needs no further machining. The cutting speed is much faster than that obtained by conventional methods [Econ. Commerc. News, 1978, 8 (18), 18].

2.2.3 Spot Welding Machine - The Advani-Oerlikon, Bombay, has produced for the first time in India a portable spot welding machine which is claimed to be unique. It (model PT-2-SP) is a lightweight, inexpensive, portable spot welder, ideal for application in the manufacture of cupboards, filing cabnets, furniture, switch-gear housings, automobile bodies, etc. Being hand operated and incorporating essentially a 'one knob' control, it is easy to operate even by an unskilled operator.

For further details, contact: Advani-Oerlikon Ltd, Block 'D', Shivasagar Estate, Dr Annie Besant Road, Worli, Bombay-400018 (F.E, 24.8.78).

2.2.4 Fluorescent Lantern - The Everest Electric Corporation, Calcutta, has introduced for the first time in India an electronic fluorescent lantern operated by a set of eight standard torch cells. The lantern can also be operated by A.C. mains supply.

The lantern is most handy, fitted with an imported six-watt fluorescent tube. It gives bright light and

works 10 hours continuously or 48 hours intermittently with one set of batteries.

It is very much suitable as emergency flucrescent light anywhere when power fails, specially in automobiles railways, mining, hospitals, offices, banks, defence services, etc. The price is claimed to be economical.

Further details can be obtained from: Everest Electric Corporation, 2, Ganesh Chandra Avenue, Calcutta-13. (F.E., 24.3.78).

2.3 CHEMICAL INDUSTRY

2.3.1 Plan Outlay for Chemical Units - The Deputy Chairman of the Planning Commission, Prof. D.T. Lakdawala, has announced that an investment of Rs 2,300 crores will be made by the Government of India in the public sector for expansion of the chemical industry during the Sixth Plan. The bulk of this investment would be made in fertilizers, petrochemicals, drugs and pesticides. Additionally substantial investment is anticipated in the private sector.

Keeping in view the significant deterioration in environmental conditions alongwith broad economic considerations the new chemical plants to be set up would be dispersed widely over the country. At present, the Indian chemical industry is concentrated in the western zone, primarily in Maharashtra and Gujarat. Even within these two States, the industries seem to

have been concentrated at particular locations, probably due to the proximity and availability of basic raw materials (E.T., 8.5.78).

3.3.2 Silica Gel - Based on a technology developed by the Regional Research Laboratory (RRL), Jorhat, three firms, viz. Deochems, Kanpur; Patalia Chemical Industries, Jamnagar; and Garg Chemicals, Gwalior; have started commercial production of silica gel. If the installed capacities of all these firms are fully utilized, about 150 tonnes of silica gel will be produced in the country annually.

The above process eliminates all the defects of conventional methods of its manufacture. The gel is of 99% purity and can be utilized for chromatographic and other special purposes.

The capital investment for a plant of capacity 50 tonnes/yr will be about Rs 2.78 lakhs and cost of production will be about Rs 10/kg.

Silica gel finds use mainly as a dessicant in industrial appliances ranging from instruments to medicine. It is also used for separation of gases in petroleum refining, as a catalyst carrier in butadiene polymerisation and in synthetic rubber industries (F.E., 15.4.78).

2.3.3 <u>NCL Technologies</u> - Processes for the manufacture of following chemicals, developed at the National Chemical Laboratory (NCL), Pune, have been released to industries for their commercialisation.

<u>Simazine and Atrazine</u> - These are the important herbicides used for the protection of maize, jowar and Bazara crops. Atrazine, in particular, is useful in regions of low rainfall. Processes for the manufacture of Simazine and Atrazine have been released to Amar Dye-Chem Ltd, Bombay.

<u>Nitrofen</u> - It is a herbicide specially useful for groundnuts, sugarcane and sorghum. The process for the manufacture of Nitrofen has also been released to Amar Dye-Chem Ltd, Bombay.

<u>Carboxin</u> - It is a systemic fungicide which is mainly used for the seed treatment of cereals against smuts and bunts, and of cotton, peanuts and vegetables against <u>Rhizoctonia</u>. Carboxin is highly specific and effective against pathogens without injuring the hosts. The process for its manufacture has been released to Sudarshan Chemical Industries Ltd, Pune.

<u>Dibutyl Tin Oxide</u> - The process for its manufacture has been released to Dura Chemical Corporation (P) Ltd, Bombay. Dibutyl tin oxide is mainly used in the manufacture of stabilizers for PVC.

Dichloropropionic Acid - It is widely used as a selective weedicide for the control of grasses in sugarcane, sugarbeet, corn, potato, and other similar crops. The process for the manufacture of dichloropropionic acid has been released to Gromor Pesticides Pvt. Ltd, Calcutta (CSIR News, 30.4.78).

2.3.4 Coal-based Fertilizer - The Central Fuel Research Institute (CFRI), Dhanbad, has developed a coal-based fertilizer which has the potentiality for considerably increasing efficiency of the stablished inorganic fertilizers. It has already undergone some application trials.

It is claimed that potency of the well-known and much used fertilizers like ammonium sulphate, urea, etc., can be doubled if they are used in conjunction with the newly developed CFRI fertilizer (B.S., 7.4.78).

2.4 MISCELLANEOUS INDUSTRIES

2.4.1 Mangalam Cement - Birla's Kesoram industries and Cotton Mills has planned to set up a cement project at Morak, an industrially backward area of Rajasthan. The project costing Rs 24 crores will have a capacity of 1200 tonnes/day. It is expected to go on stream by the middle of 1980 (B.S., 22.4.78).

2.4.2 High Outlay for Sugar Industry - An outlay of Rs 770 crores has been recommended by the Sugar Development Council for the sugar industry during the period

1978-83. Assuming the requirement of sugar to go up to 88 lakh tonnes, the installed capacity of 75.5 lakh tonnes has also been proposed. The installed capacity at the end of 1977-78 is estimated at 54 lakh tonnes. This assessment has been made on the assumption of growth rate of GNP as 4.5% and the annual growth rate of 2.1% in per capita income. This outlay includes Rs 660 crores for additional capacity and Rs 110 crores for modernization.

The production of <u>Gur</u> and <u>Khandsari</u> is also estimated to increase to 89.5 lakh tonnes as against 84.5 lakh tonnes at present. Requirement of cane including the seed and chewing purposes has been projected as 18.5 crore tonnes [<u>Econ. Commerc. News</u>, 1978, <u>8</u> (11) 9].

2.4.3 <u>Carbonless Copying Paper</u> - The Titaghur Paper Mills has been given license to manufacture No Carbon Required (NCR) paper (carbonless copying paper), utilizing the technology developed at the Regional Research Laboratory, Jorhat. This company will be the first one in the country to utilize this indigenously developed technique.

NCR papers will replace the carbon inserts used with conventional uncoated paper for making multiple copies which has several limitations and disadvantages and cannot suitably be utilized in modern business

machines like electronic data processing equipment, computers, teletype adding machines, etc. (F.E., 27.3.78).

2.4.4 Industrial Waste Disposal - A Japanese company has developed a unique process in which earthworms are utilized to dispose of industrial waste with profit. The process prepares an ideal food for the earthworms utilising the mud waste from the paper mills and food processing industries. The earthworms fed on this waste product produce faeces, which is valued as an excellent fertilizer.

At present there are 20 plants in Japan producing 2,000 tonnes/day of earthworm excreta as valuable fertilizer for agriculture. This amounts to 7.2 lakh tonnes/yr of fertilizer from industrial waste. Each plant uses 30 tonnes/day industrial waste for feeding 30 tonnes of earthworms each weighing 0.25-0.5 gm. The plants are spread over an area of 10,000 sq.m.

Based on above know-how an American company will breed earthworms and plans to erect a plant at Ugine, Oregon, to pioneer the economic use of industrial waste.

This technology will enable paper mills and food processing units to utilize their tremendous waste [Indian Chem. J., 1978, 12 (9), 40].

3. ANNOUNCEMENTS

3.1 AWARDS

3.1.1 An Import Substitution Award has been given to the Swif[t] Private Ltd, Bombay, for the manufacture of indigenous Offset Printing Machines.

3.1.2 A Cash Award of Rs 50,000 has been offered by the Perfec[t] Machine Tools Trust for the best innovative design in t[he] field of machine tools. The award will be presented in February 1979 at the Imtex-79 exhibition organized by the Indian Machine Tools Manufacturers' Association.

* * * *

3.2 TRAINING

3.2.1 16th Annual 3-Tier Programme for Management Development organized by the Indian Institute of Management, Ahmedabad, will be held at Agra. The timings for the programme are: (i) Middle Management Course (Aug 6 to Sept. 2); (ii) Senior Executives Course (Sept.3 to 20); and (iii) Top Management Seminar (Sept. 21 to 29).

Further details can be obtained from: Programmes Officer (MDP), Indian Institute of Management, Ahmedaba[d] 380015.

3.2.2 Job Oriented Post Graduate Diploma Courses on Managemen[t] Sciences (both regular and postal tution) announced by the Academy of Management Sciences and Studies, Madras, are: (i) Business and Industrial Management (6 months); (ii) Exports Marketing Management (5½ months); and

(iii) Personnel Management and Industrial Relations (6 months).

Further details can be obtained from: Shri V.S. Aiyer, Director, Academy of Management Sciences and Studies, Plot No. 10, 21st Cross, Indranagar, Madras-600020, Phone 411545.

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3.3 PUBLICATIONS RECOMMENDED

3.3.1 Eastern Economist, Annual Number 1978, Editor, V. Balasubramanian; Eastern Economist Ltd, VCO Band Building, Parliament Street, New Delhi; Price Rs 20.

This publication is completely devoted to the States in India, the progress or lack of progress made by each over the years in agriculture, power, irrigation, industry and transport and also the future direction of growth open to them (E.T., 9.4.78).

3.3.2 Economic Growth and Technological Change in India, Benin Behari; Vikas Publishing House; Pp XVII + 274; Price Rs 40.

This publication gives an expert exposition of questions such as the nature of appropriate technology, technological transfers, and the sociological impact of innovative and adaptive technologies. The author has also analyzed the new agricultural strategy, the changing industrial structure, and the trends in urbanization.

This book is good for both students of economics and social engineers engaged in policy formulations [J.Ind.& Tr., 1978, 28 (1) 31].

3.3.3 Technologies for Basic Needs, Hans Singer; International Labour Office, CH-1211, Geneva-22; Pp 158; Price 20.

This publication discusses the different aspects of technology with particular reference to development planning in countries trying to meet the basic needs of t society and suggests certain guidelines for arriving at a "appropriate technology" (F.E., 9.4.78).

* * * *

3.4 EXHIBITIONS

3.4.1 The 6th Chemical International and MAC 78 exhibitions will be held simultaneously with the 15th International Biennial Exhibition of Automation and Instrumentation at the International Fair grounds, Milan, from November, 21-25, 1978.

Further details can be obtained from: Secretary B.I.A.S./MAC Office, Dr Antonio Barbieri Editore, Viale Premuda 2-20129, Milan, Italy.

3.4.2 Oil and Natural Gas Commission import substitution exhibition, to be held at Tel Bhavan, Dehra Dun, has invited manufacturers of engineering machinery like high horse power diesel engines, compressors, metallic and rubberized parts, roller transmission chains, friction discs, etc.

For further details contact: Suptdg Engineer (mech), Import Substitution Group ONGC, on any working day between 2 and 4 hours.

* * * *

3.5 SEMINAR and CONFERENCE

3.5.1 A Seminar on Exports will be held at Hotel Maurya on June 23-25, 1978.

Further details can be obtained from: Indian International Centre,105, Nirmal Towers, Barakhamba Road, New Delhi.

3.5.2 An International Conference on the development and application of appropriate technology will be held in India in November 1978, under the auspices of the United Nations Industrial Development Organization.

It will be both at official and ministerial levels and would be attended by over 35 countries including developing and a few developed countries.

Vol. 1 No. 7 July 1978

INDUSTRIAL NEWS DIGEST

- INDUSTRY PROFILE
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- ANNOUNCEMENTS

PUBLICATIONS & INFORMATION DIRECTORATE, CSIR
Hillside Road, New Delhi-110012

INDUSTRIAL NEWS DIGEST

Vol.1, No.7, July 1978

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Industrial News Digest is a monthly bulletin issued by the Publications & Information Directorate. A part of the newly-formed Industrial Information Service of the Directorate, the Digest aims at providing packaged, down-to-earth technological and techno-economic information to Industrialists, prospective entrepreneurs, and experts in both government and private agencies dealing with the management and planning of industry. Queries on technical and techno-economic matters are welcome.

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Publications & Information Directorate
(CSIR), Hillside Road, New Delhi-110012

Abbreviations Used

1. B.S. - Business Standard
2. E.T. - Economic Times
3. F.E. - Financial Express
4. H.T. - Hindustan Times

Standard abbreviations are used in the case of all scientific and industrial periodicals.

1. INDUSTRY PROFILE

PLASTICS INDUSTRY (I)

Although the discovery of nitrocellulose in 1865 was the first successful attempt towards the development of plastics, the "modern" plastics industry actually came into being in 1926 when products like cellulose acetate, acrylics, vinyls, polystyrene, and high and low density polyethylenes (HDPE and LDPE) were introduced on a commercial scale. The growth of the industry, specially in the developed countries, has been so rapid that already more than 50 different types of plastics have come into existence.

The Indian plastics industry made a modest start in 1926 with the manufacture of combs, soap-boxes, and other domestic products from imported celluloid sheets and rods. However, it was only after World War II that the industry came of age. In the first decade of development, attention was directed at the expansion of the processing sector, with the help of imported raw materials and machinery. The emphasis on raw material manufacture came during the Second Plan.

The plastics industry comprises two principal branches--the production of plastics materials and the fabrication of plastics products.

Basic Raw Materials

The principal raw materials required for the manufacture of plastics and additives used during the course of manufacture and in the subsequent processing stage are: ethylene, propylene, butadiene, vinyl chloride and styrene. Production of plastics raw materials is greatly linked up with the development of petrochemical industry which supplies the basic raw materials or monomers to plastics industry. In India, there are five main units manufacturing chemical products other than ammonia from petroleum feed-stocks: Union Carbide India Ltd; National Organic Chemical Industries Ltd; Indian Oil Corporation, Bombay; Fertilizer Corporation of India, Trombay; and the aromatics plant of Indian Petroleum and Chemicals Ltd (IPCL), Baroda. In addition, Plastics Resins and Chemicals, Tuticorin, has a 20,000 tonnes/yr polyvinyl chloride (PVC) plant based on naphtha cracking.

Plastics Materials

The chief ingredient in plastics is a resin, mostly of synthetic origin. Resins are obtained from the organic compounds mentioned under Basic Raw Materials by polymerization reactions. The resin is converted into a moulding (plastic) material by compounding.

Though varied and complex in nature, plastics can be broadly classified into two categories, namely,

thermosetting and thermoplastic. The former hardens on heating (curing) into a permanent shape, whereas the latter does not undergo any permanent change on heating and, therefore, can be reshaped any number of times.

Typical examples of thermosetting plastics are the phenolics, polyesters, epoxies and silicones, while thermoplastics include: HDPE, LDPE, PVC, polystyrenes, polypropylene, ABS/SAN (acrylonitrile-butadiene-styrene/ styrene-acrylonitrile), PMMA (polymethyl methacrylate) and nylon.

Present position - At present practically all important plastics raw materials like HDPE, LDPE, PVC, polystyrene, cellulose acetate (C.A.) flakes and moulding powder, etc. are produced in India.

Producers of raw materials number 20 and processors well over 100 in the large scale sector and about 5,000 in the small scale sector. The number of units manufacturing LDPE, HDPE, polystyrene, and PVC are 3,1,2, and 5 respectively. At present, polypropylene is not produced in India. However, IPCL is expected to start its production soon. Three units are approved for ABS manufacture.

There is a stagnation and fall in production of raw materials during the past years. The Indian plastics industry has yet to cross its production target of 1.5

lakh tonnes (Table 1), although the immediate potential for production is about 1.85 lakh tonnes.

TABLE 1 - INSTALLED CAPACITY AND PRODUCTION OF PLASTICS MATERIALS

	Present installed capacity	Production			
		1974	1975	1976	1977†
M.F. moulding powder	3	102*	116*	157*	n.a.
P.F. moulding powder	9	4.5	3.79	3.71	n.a.
U.F. moulding powder	9	1.66	1.77	2.23	n.a.
Polyester resin	3	800*	700*	n.a.	n.a.
LDPE	110	26.13	27.84	30.15	22.79
HDPE	30	24.62	21.01	22.82	23.70
Polystyrene	26	9.85	13.84	12.32	14.72
PVC resins	85	47.43	42.88	46.94	56.99
C.A. moulding powder	7.2	1.37	1.00	1.10	n.a.

*In tonnes

† Although item-wise break up figures for thermosets are not available, the total production of these plastics for the year is estimated at 7,250 tonnes.

Shortage continues for bulk consumption materials like polyethylene and PVC. The situation will, however, improve substantially with the commissioning of the IPCL projects, specially when they go on full stream by 1980.

This year the indigenous production of three versatile thermoplastics, viz. polypropylene, ABS and PMMA is assured. Moreover, the availability of LDPE is also likely to increase. The target for the production of plastics materials by 1980 is 3 lakh tonnes.

Thermosetting materials form an important sector of plastics industry, although their production at present is only about 7,000 tonnes, ie. about 5% of the total production of plastics materials. They cater primarily to the core sector industries like power generation and distribution, electronics and telecommunication equipment, automotive equipment, fertilizers and basic chemical industries, and defence industries.

The main raw materials used for thermosetting plastics are phenolic resins, urea formaldehyde resins, melamine resins, polyester resins and phenolic industrial laminates.

Demand and Consumption

Anticipated demands (in thousand tonnes) for the main plastics materials for 1983-84 are: LDPE, 184; HDPE, 60; polypropylene, 35; PVC, 185; ABS/SAN, 60; acrylics, 25; polyacetals, 5; polystyrene, 25; polyester resins, 3; and moulding powders--C.A., 10; M.F., 5; P.F., 9; and U.F. 9.

Against the above demands, the expected figures for availability in 1983-84 of some important plastics materials (in thousand tonnes) are: LDPE, 110; HDPE, 30; PVC, 135; polypropylene, 30; ABS, 10; and polystyrene, 20. Thus, the total availability comes to 3.35 lakh tonnes. The increased availability of LDPE from and the starting of polypropylene production by IPCL would contribute to acceleration of demand, lowering of prices and greater market penetration.

The present pattern of consumption (%) of PVC, LDPE, HDPE and polystyrene in the large and small scale sectors are: 54 and 46; 19 and 81, 20 and 80; and 53 and 47.

Auxiliary Chemicals

Additives such as plasticizers, stabilizers, lubricants, fillers, colourants, and other chemicals are usually added to resins to produce plastics materials. Plastics compounds invariably contain small quantities of catalysts or accelerators. Besides, other ingredients added in small amounts include pigments and dyes, anti-oxidants, antiseptic agents, fungicides, flame retardants and blowing agents.

With the expansion of Indian plastics industry, the requirements of auxiliary chemicals have increased consi-

derably. Although quite a few are being imported, a beginning has been made towards the manufacture of some of them indigenously.

New Polymers

The planning group on petrochemicals has identified a number of projects oriented towards the development of newer polymers for different applications and for meeting various needs in the rural sector. The latter aspects need attention from research workers in respect of plastics, particularly their weathering characteristics and fire resistance.

Development of compounded and filled grade co-polymers to suit specific end-uses, including development of processing conditions and techniques for engineering plastics like ABS/SAN, polycarbonates, etc. offer immense scope for innovative work in future. Development of technology for structural plastics foams, and plastics composite materials, diversifications of their applications, both consumer and industrial, also offer vast potential for adoption and acceptance in the country.

Engineering plastics - A new class of plastics known as engineering plastics, has now come on the scene that can substitute for metals. In certain ways these materials are better suited to particular engineering

functions like extrusion, resistance to abrasion, ability to withstand high temperatures and corrosive acids, component formation, and heat-exchanging. They are used in interior trim application in passenger car bodies and marine industry applications, and in manufacturing valves, pumps and fittings. Plastics engineering products can successfully replace non-ferrous components. It is estimated that about Rs 4 crores worth of plastics can easily replace Rs 50 crores on non-ferrous metals.

Nylons, which are stronger than steel, had been used even as gear components for a very long time. But, sophisticated engineering plastics are of more recent origin. In current use are thermoplastics like acrylonitrile-butadiene-styrene, polycarbonates, admirably adapted for light mechanisms as well as heavy parts such as fuel tanks and many smaller automotive parts. The use of chopped-glass fibre filling, which can increase tensile and flexural strength (resistance to bending or flexing) by about 7,000 lb/sq inch, has increased the scope for such uses. Thus, even the commonly-used thermoplastics have now bestowed metal-like properties through use of reinforcements and fillers.

The four new engineering plastics, which have recently come on the markets of HDCs, and which are providing extra sophistication to their engineering

products and are also reducing overall manufacturing costs are: polyurethane plastic (polysets), polyamide-imide (torlon), polyvinylidene fluoride (solef), and various grades and types of polypropylene. Their trade names are given within the parantheses. Of these, only last one is in production in India.

The use of plastics engineering materials, however, in India is limited because of exorbitant import duty amounting to 208% till very recently. Even the present 145% duty is very high.

Processing Plants

The main factor which has been responsible for the spectacular growth of plastics industry during the past decade is the availability of a wide range of plastics processing plants and equipment. The plastics processing industry requires a variety of machines like extrusion machines, injection moulding machines, blow moulding machines, calendering equipment, spreading machines, and other ancillary and take-off equipment. Of late, sophisticated equipment like semiautomatic thermoforming machines have also been developed in the country. Table 2 gives the present estimated manufacturing capacity of important plastics machinery.

TABLE 2 - CAPACITY (Nos) OF PLASTICS MACHINERY

	Large scale sector	Small scale sector	Total
Injection moulding machine	575	353	927
Extruders and extrusion lines	232	380	612
Blow moulding machines	110	62	172

The substantial expansion of petrochemical industry during the Fourth and Fifth Plans underscores the importance of increasing the production of chemical plant equipment and machinery. The facilities available at the Bharat Heavy Plates & Vessels have made a significant contribution in this direction.

[The second and concluding part of the profile on Plastics Industry will cover separate accounts of plastics products, small scale plastics industry, problems of the industry in general, and export and import of plastics materials and products. - Ed.]

A N N O U N C E M E N T

The _Industrial News Digest_ have since been carrying profiles on selected industries. For a change, we are giving a comprehensive essay on The Indian Chemical Industry in our October issue. The essay will cover the following aspects of the Industry: Origin and growth of the industry in India, its present status, production and trade, research and development activities, future prospects, and the problems of this industry in general.

The Industry Profile will, however, continue to be our regular feature. In order to help us select the topics of interest, for such profiles, we shall welcome suggestions from our readers.

2. INDUSTRIAL NEWS

2.1 GENERAL

2.1.1 Industrial Growth Rate - The growth rate in Industrial production in 1977-78 is just 4% as against 10.4% in 1976-77. This is attributed to slower growth in industri like steel, coal, cement and power. The attendant factor were decline in the public investment in the earlier year shortages of power and slackness in demand in certain sectors.

Major cases of fall in production of 20% and more include aluminium conductors, scooter tyres, seamless tubes, C.I. spun pipes, vehicular diesel engines, and rubber machinery. Except electrical and textile machiner all the machinery producing units were working very much below capacity. Power shortage and demand constraints were the factors affecting production in EC grade aluminium, coated abrasives, steel pipes and tubes, railway wagons and road rollers.

On the other hand, encouraging production trends wer observed in industries like food processing chemicals, electrical, mining and quarrying.

Shri George Fernandes recently announced that the government is planning a 7-8% growth rate in 1978-79. Proper measures will be taken to overcome difficulties in power generations and in sphere of railway transportation. Wagon production would also be stepped up.

Other decisions cover a new strategy to boost the production of all types of commercial vehicles, effective monitoring of the ongoing cement plants, erection of new ones, and measures to help the chemical industry. Steps will be taken up to attract new investment, liberalising import licences of technical know-how and providing incentives for the setting up of captive power plants by the individual units (E.T., 9.5.78; H.T., 10.6.78; Hindu, 19.6.78).

.2 <u>Small Scale Prosperity</u> - The present industrial policy portends a bright future for the small scale industry. In the past few months, 188 district industrial centres (DIC) have been set up. (<u>The Industrial News Digest</u>, Feb.'78, carried a news item about the proposal for setting up such centres).

At the recent State industries ministers' conference, it was announced that 450 DICs will be set up by 1981-82. In addition a special wing to cater to the needs of this sector will be set up in the Industrial Development Bank of India (IDBI).

Shri George Fernandes told the above conference that commercial banks would depute personnel for DICs for 2 years and thus would give the States time to complete the recruitment of personnel for DICs.

It is hoped that given the necessary finances and backing of the centralized institutions like IDBI, the small scale sector would have an uninhibited growth. In addition a long list of items have been reserved for this sector.

A notable feature of the Sixth Plan (1978-83) is that the large scale sector has been allotted only 13% of the total outlay as compared to 17, 18, 20 and 20% in the V, IV, III and II Plans respectively. Hence the Sixth Plan outlay should give a boost to the morale of the so far undernourished small sector.

It would perhaps, not be a wishful thinking to expect a 300% increase in the turnover of the small scale sector by the end of the Sixth Plan, as targetted by planners.

What is really needed is a judicious and balanced investment in proper technology, equipment, skill and organization.(E.T., 10.6.78).

*   *   *   *

2 ENGINEERING INDUSTRY

2.1 Rejuvenating Engineering Exports - It is expected that during the next 2-3 years, the engineering exports may not maintain the 20% growth rate achieved in the last 5 years. Therefore, the Engineering Export Promotion Council (EEPC) has envisaged a planned programme to maintain the 20% growth rate in the eighties.

According to Shri Suresh Mehta, Chairman of EEPC, targets of Rs 1,000 crores and Rs 2,000 crores are set for 1980-81 and 1984-85 respectively. By the end of the eighties, exports are expected to touch Rs 6,000 crores. Project exports, entering the EEC market, and exports by small scale sector should help in achieving these targets.

As a measure to boost engineering exports, purchasing and marketing executives of European companies will be invited to India by the end of this year. Also, about 60 Indian delegations related to specific products will be sent to these countries. Two high-powered delegations will be visiting south east Asian countries and east and central African countries, which provide very good scope for exports. In September, another delegation will visit China and take part in the Canton Trade Fair.

An export-import bank may be set up to facilitate easy operations of guarantee, insurance, credit, pre- and post-shipment transactions, etc. (Engng Times, 8.6.78).

2.2.2 Rural Steel Industries - SAIL experts have identified 50 steel items for rural use. When this plan is fully implemented in rural areas, a considerable increase in the demand for steel is expected. The 50 items comprise 11 for farming, 8 for blacksmithy, 10 for carpentry and woodwork, 4 for masonry, 4 for cobblers, 2 for village transport, 8 for different service facilities and 3 for steel storage bins.

Two groups had been set up by SAIL to promote the use of steel in rural areas. The production group will cater to the needs of designing, manufacturing, training of personnel, etc. It will also set up workshops to promote the use of steel in villages and blocks.

The second or marketing group will identify products to be used in villages and its efforts will be concentrated on the entrepreneurs. Regular workshops will be held for them. After 6 months, when experience is gained from these workshops, more areas will be brought under the SAIL groups

In view of the above developments it is likely that a number of small industries using steel will be set up in villages, which should provide considerable employment opportunities. Also, there are 13 million bullock carts in India which require redesigning.

It is expected that with a capital outlay of Rs 4 lakhs for such industries, there will be an output of Rs 20-25 lakhs (Engng Times, 8.6.78).

2.2.3 <u>Rotor Induction Current Meter</u> – A rotor induction current meter has been developed by the National Institute of Oceanography (NIO), Panaji. It uses electric induction for sensing the rotation of the rotor. The instrument consists of a light rotor which rotates proportional to the magnitude of current. The specifications of the current meter are: current speed 300 cm/sec; accuracy ± 1 cm/sec; power supply 9 v; and power consumption 25 mA.

The outstanding features of the rotor induction current meter are: (i) the rotor is not affected by any load while producing signals and is free to rotate; (ii) the sensor used does not require water tight chamber; (iii) the instrument is quite small, light and rugged in construction; (iv) the ballast weight and directivity fin required are also proportionately small, making the operation of the meter easy and convenient; (v) the current measurement is absolute and is not affected by the direction as no directivity is required for current is indicated in digits /_ <u>Econ. commerc. News</u>, 1978, <u>8</u>(23), 14 _7.

* * * *

2.3 CHEMICAL INDUSTRY

2.3.1 Chemical Exports Down - The total export of basic chemicals, pharmaceuticals and cosmetics during 1977-78 is estimated at Rs 147 crores as compared to Rs 164.2 crores in 1976-77. Although the Basic Chemicals, Pharmaceuticals & Cosmetics Export Promotion Council expects that the final figures for 1977-78 would be more than the present estimated figure (Rs 147 crores), it is not likely that the figure would come near the target of Rs 180 crore set by the council.

During 1977-78 exports of organic, inorganic and agrochemicals fell to Rs 19.8 crores from the 1976-77 figure of Rs 27.62 crores. In the same span, exports of dyes, intermediates, alcohol and coal tar chemicals fell from Rs 32.17 crores to Rs 28.29 crores. Indigo exports came down sharply from Rs 4.93 crores in 1976-77 to Rs 2.33 crores in 1977-78 (E.T., 21.4.78).

2.3.2 Carbon Black from Coal - A pilot plant to produce carbon black from coal, based on a process developed by the Regional Research Laboratory (RRL), Jorhat, has been installed at the Laboratory. The process has been purchased by Young Entrepreneurs of Assam. Assistance is being received from the National Research Development Corporation and Engineers India Ltd. The latter has also technologically evaluated the product.

According to Dr. R. Hague of RRL a tonne of coal valued at Rs 140 would produce carbon black worth Rs 1,230. The project to be set up by the Young Entrepreneurs after completion of pilot plant studies would cost about Rs 3 crores and employ about 500 skilled and unskilled workers (B.S., 8.6.78).

.3.3 Sulphuric Acid, Alums & Oleums - Bharat Alums & Chemicals has embarked on a project to manufacture annually 16,500 tonnes of sulphuric acid; 3,600 tonnes of oleum (20-30%) and the same amount of oleum (65-70%); and 16,500 tonnes of alumina (ferric) and 600 tonnes of alumina (ferric free) at Alwar, Rajasthan.

Designed in collaboration with Dharamsi Morarji Chemical Co., Bombay, the capacity of sulphuric acid production can be doubled when necessary.

Of the chief raw materials bauxite and alumina hydrate are indigenously available. Sulphur will be imported (B.S., 24.5.78).

.3.4 Titanium Pigment - As a part of a huge tinanium complex, a titanium dioxide pigment plant (annual cap. 4,800 tonnes) would be commissioned at Quilon, Kerala, by 1980. This unit, the first to use the chloride process, will reach its full capacity in three years.

India, which is at present importing titanium dioxide, will not only be self-sufficient but will be exporting this compound after the plant reaches its rated capacity (E.T., 25.4.78).

2.3.5 Salicylic Acid - Only one Indian firm is now producing salicylic acid in collaboration with Monsato Chemicals Inc., USA. It manufactures only about 1,200 tonnes of the acid per year against a demand of 3,000 tonnes/yr. The difference is imported. As the firm is not very eager to part with the know-how, the government is now looking for some new process to manufacture salicylic acid (B.S., 5.4.78).

* * * *

2.4 MISCELLANEOUS INDUSTRIES

2.4.1 Sal Seed Oil Unit - The Bihar State Forest Development Corporation, the State Industrial Development Corporation and the Bihar State Cooperative Marketing Union have planned to set up a Sal oil unit jointly at Latibar in the industrially backward Palaman district. It is expected that the plant would be commissioned within a year and would consume about 30,000 tonnes of sal seed annually [Industr. Develop. News, 1978, 13(2), 14].

4.2 Paraffin Wax from Petroleum - A technique for manufacturing paraffin wax from petroleum residue by air sweating process has been developed by a Madras technocrat, Harikishan. The technique is the only one of its kind in India and will save foreign exchange worth about Rs 1 crore.

In this process, paraffin wax would be extracted from the slack wax procured from the Madras Refineries (E.T., 12.6.78).

4.3 Adhesives from Scrap Tyres - A new technique to reclaim adhesives from old discarded tyres has been developed by research staff of the Osaka Prefectural Government's Industrial - Technology Laboratory.

This method is characterized by at least three features: (i) easy decomposition of styrene-butadiene rubber, (ii) applications to a wide range of waste tyres, and (iii) good economics because of the fact that existing reclaiming equipment can be employed. In Japan, tyres weighing approximately 7 lakh tonnes are discarded every year [Chem. Take-off, 1978, 7(5), 9].

4.4 Neoprene Jacket V-belt - The Fenner (India) Ltd, has for the first time in the country introduced a neoprene jacket V-belt. The neoprene (polychloroprene synthetic rubber) jacket will give the new belt total protection from oil, grease and other contaminants, thereby increasing

the belt life. In addition, the belt will also have high resistance to fatigue, abrasion and heat, and will have a higher flex life.

Further information can be obtained from: Fenner (India) Ltd, Hansalaya, 7th Floor, 15, Barakhamba Road, P.O. Box 755, New Delhi-110001 (F.E., 5.6.78).

2.4.5 Biostat Technology - The Central Food Technological Research Institute (CFTRI), Mysore, has successfully developed a technology for manufacturing highly automated laboratory biostats. Biostats are essential tools for development and optimization of industrial fermentation process in the production of antibiotics, vitamins, steroids, enzymes, organic acids, foods and chemicals.

The biostat has computer compatibility with digital read-out of control parameters (F.E., 26.3.78).

3. ANNOUNCEMENTS

1 AWARDS

1.1 Export Awards for 1976-77 have been won by two units of Santacruz Electronics Export Processing Zone (SEEPZ), viz., Clarostat and Saha Soshin. This is the first time, a private firm in the electronic industry has been given an export award.

1.2 National Awards for 1976-77 have been given to 52 exporters for their outstanding performance in exports. There are 16 winners of trophies and 32 winners of certificates of merit among these award winners.

1.3 The Indian Paint Association has invited Research and Review papers on subjects directly related to organic coating industry and broadly concerning to paint technology, process development, paints application, raw materials, machinery and equipment for paint industry for IPA Awards 1978.

The last date for receiving papers is 16.8.78.

Further details can be obtained from: The Senior Assistant Secretary, the Indian Paint Association, India Exchange, Calcutta-700001.

* * * *

3.2 TRAINING

The Indian Investment Centre is considering the possibilities of starting more training programmes for both technicians and non-technical entrepreneurs all over the country. The Centre's training programmes at Calcutta have yielded good results and have triggered off 16 small scale projects in West Bengal.

* * * *

3.3 PUBLICATIONS RECOMMENDED

3.3.1 Export Opportunities and Problems of Indian Engineering Products, the Indian Institute of Foreign Trade: Ashok Bhawan, 93, Nehru Place, New Delhi-110019; Price Rs 10.

This publication contains a brief review of the Indian engineering industry, highlights various export promotion measures taken by the Government and embodies data on India's exports - both item-wise and country-wise and world exports. Its major thrust is on the identification of export opportunities and problems [Foreign Tr. Bull., 1978, 8(9), 10].

3.3.2 Commerce - Annual Number 1977, Vadilal Dagli; Commerce Ltd, Manek Mahal, 90 Veer Nariman Road, Bombay-400020; Pp 320; Price Rs 25.

The theme of the annual number of the weekly Commerce, is 'Energy in Indian Economy'. The present

pattern of consumption of energy in the urban and rural areas is dealt with in detail. The State-wise power position is also given (F.E., 16.4.78).

3.3 Capital - Annual Number 1978, A.K. Ganguly; 19, R.N. Mookerjee Road, Calcutta; Pp 174; Price Rs 15.

The annual number of the weekly Capital, presents a survey of economic and public affairs. This issue also covers among other subjects, the freedom of the press, foreign service, credit policy, revival of sick units, engineering exports and Centre-State relations (F.E., 16.4.78).

* * * *

4 FAIRS

4.1 An International Fair organized by the Trade Fair Authority of India, will be held in Moscow in August 1978.

About 350 Indian concerns, both from public and private sector will participate in this month-long fair. The highlights of the fair will be mainly India's recent advances in the spheres of engineering, chemical technology and textiles as well as traditional fields like leather, processed food, shellac and mica.

* * * *

3.5 SEMINARS

3.5.1 A Seminar on Engineering Education and Training Methodologies for improving the Indigenous Engineering Capability of Developing Countries will be held at Tripoli (Libya) on September 9, 1978, under the auspices of the World Federation of Engineering Organizations.

Further information can be obtained from: The Secretary and Director-General, the Institute of Engineers (India), 8, Gokhale Road, Calcutt-700020.

3.5.2 A three-day Symposium on Electron Devices organized by the Central Electronics Engineering Research Institute will be held in Pilani in the second half of September 1978.

The symposium will cover: (i) high power and microwave tubes, (ii) semiconductor power and microwave devices, (iii) integrated circuit technology (monolithic and hybrid), and (iv) special devices and emerging technologies (e.g. optoelectronic devices, SAW devices, CCDS amorphous semiconductor devices, solar cells etc.).

Further particulars can be obtained from: Dr K.S. Srinivas, Head IP & L Group, Central Electronics Engineering Research Institute, Pilani-333031.

3.5.3 A National Solar Energy Convention of the Solar Energy Society of India will be held at the Central Salt and

Marine Chemical Research Institute, Bhavnagar (Gujarat), from December 20-22, 1978.

The highlights of the convention will be: (i) Photovoltaics, photochemistry, photobiology and radiation; (ii) solar flat plate collectors; (iii) solar concentrators; (iv) solar thermal power system; (v) space heating and cooling; (vi) energy storage; (vii) rural applications; (viii) selective coating and (ix) industrial applications.

* * * *

6 Technology Centre

A technology centre to pool technical expertise in Gujarat for the benefit of new entrepreneurs has been set up as a part of the industrial extension bureau of the State Government.

The centre would prepare project profiles for various industries that have scope to come up.

Vol. 1 No. 8 Aug. 1978

INDUSTRIAL NEWS DIGEST

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PUBLICATIONS & INFORMATION DIRECTORATE, CSIR
Hillside Road, New Delhi-110012

Vol.1 No.8 August 1978

INDUSTRIAL NEWS DIGEST

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* Industrial News
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Publications & Information Directorate
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INDUSTRIAL NEWS DIGEST

Vol.1 No.8 August 1978

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Industrial News Digest is a monthly bulletin issued by the Publications & Information Directorate. A part of the Industrial Information Services of the Directorate, the Digest aims at providing packaged, down-to-earth technological and techno-economic information to industrialists, prospective entrepreneurs, and experts in both government and private agencies dealing with the management and planning of industry. Queries on technical and techno-economic matters are welcome.

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Abbreviations Used

1. B.S.	-	Business Standard
2. E.T.	-	Economic Times
3. F.E.	-	Financial Express
4. T.I.	-	Times of India

Standard abbreviations are used in the case of all scientific and industrial periodicals.

1. INDUSTRY PROFILE

PLASTICS INDUSTRY (II)

(Part I of this profile appeared in previous issue, covers the origin of Indian plastics industry in brief, basic raw materials used, plastics materials and their present status as regards their production, demand, consumption and availability, capacity of machinery and equipment used in plastics processing. A brief account of auxilliary chemicals used in the industry and the recently introduced new polymers is also given).

Plastics Products

A wide range of industrial utility and novelty items are now being manufactured by the Indian plastics industry. These are apart from such semi-finished products as leather cloth, sheetings, foams, laminates, films and lay-flat tubings. Of the more important items being manufactured, mention may be made of the following; electrical accessories, radio cabinets and accessories, telephone equipment, kitchen ware and crockery, fountain-pens, wall tiles, textile bobbins, gramophone records, insulated cables and wires, spectacle frames, raincoats, footwear, auto-seat covers, carboys, refrigerator components, calenders, life-jackets, insulation boards and tapes, magnifying glass, tubes and pipes, imitation cane furniture, sanitarywares, auto-accessories, air-conditioner grilles, brushes, bookbinding cloth, clinical and surgical instruments, lifebuoys, gaskets, industrial goggles, numerals and alphabets, measuring tape, buttons, toys and novelties.

The capital investment in the plastics industry i

nearly Rs 400 crores. Of this, volume of thermosets business is nearly Rs 45 crores. The industry directl employs around 3.5 lakh persons.

Demand and Consumption

The consumption of plastics in India is very low. The per capita consumption in the country is only abou 200 grams against 60 kg or more in USA, Japan or West European countries. Present requirement of plastics f agriculture is around 8000 tonnes, which is expected t grow to 26,400 tonnes in 1983 and 53,700 tonnes in 198

Small Scale Sector

There are well over 100 units in the large scale sector engaged in the manufacture of various plastics products. Bulk of the plastics processing units are, however, in small scale sector which accounts for over 60% of the total plastics materials consumed in the country (90% of thermosetting plastics raw materials a being consumed by small scale, tiny and ancillary indu tries). At present, there are about 5,000 small scale plastics processing units spread all over the country. These units are providing gainful employment to nearly 3.5 to 4 lakh workers. The total investment in the small scale sector would be about Rs 300 to 325 crores

Because of the non-availability of the raw material the idle capacity of these units varies from 40 to 60%. This sector is likely to play an important role in the near future with the easy availability of raw material from the forthcoming projects of IPCL. The industry, particularly, in the processing sector, is ideally suited for the establishment of small scale factories.

In the recently-announced industrial policy, the following additional products are reserved for exclusive development in the small sector: plastic raincoats and similar other thermo welded products; polypropylene tubular films except biaxially oriented; fibre-glass reinforced plastics products, hessian and paper to polyethylene laminations (straight and sandwiched); industrial items from engineering plastics; tooth brush; fountain-pens, ball point pens and their components (except metallic tips); plastics collapsible tubes; plastics combs; PVC pipes and fittings including conduits (up to 100 mm diameter); acrylic sheets; PVC compounds; polypropylene box strappings; polyethylene and PVC flexible hoses; monofilaments from polypropylene; polyurethane foam and its products; polystyrene foam and its products; compression moulded products from urea formaldehyde and phenol formaldehyde powders.

It may be added in this connection that following products are already reserved for manufacture in the small scale sector: (i) bottle caps, buttons, lamp-shades, etc. produced by the compression moulding technique, (ii) plastics articles manufactured from plastics sheets rod or tubes by the fabrication technique except vacuum forming; (iii) polyethylene films with a thickness of less than 0.1 mm and products from the films such as coloured printed films and bags; (iv) blow moulded containers and other similar products manufactured by the blow moulding technique; (v) spectacle frames from sheets by fabrication techniques or by injection moulding, and (vi) manufacture of polyester sheets for buttons and processing of the sheets so produced to manufacture buttons; flash light torch cases; HDPE monofilament yarn.

Problems

Plastics industry is struggling with many critical problems for the past many years. Shortages of PVC resins is the major one.

The main reason for the low production and consumption of plastics in India is the high cost of plastics raw material, The limited production capacity of raw material plants in the country and the high cost of basic chemicals have contributed in pushing up the final price of the raw materials.

The progressive stepping up of levy has affected all the sectors of the industry leading to a sizable decline and stagnation in production and consumption. The customs duty on plastics raw materials is also quite high ranging from 89-208%. As a result, processing units are forced to close down their factories or work below 50% of their installed capacity.

The hike in the price of naphtha, the main feedstock for petrochemicals, has also burdened the industry. Excise duty on its price has resulted in cost escalation and in pushing the prices of plastics to an uneconomical extent. The price of engineering plastics is abnormally high.

At present, some finished and semifinished plastics articles attract excise duty even though they are made from duty paid raw materials.

Exports

The performance of plastics industry in the field of exports is highly commendable. It has shown a remarkable growth; from Rs 18.09 crores in 1976 the export jumped to 26.04 crores in 1977. It is expected to increase further to Rs 40 crores during 1978. Plastics moulded and extruded goods, electric accessories, spectacle frames and immitation jewellery are among the major items of exports. HDPE woven sacks are reported

to be in considerable demand. The West Asian countries are the major importers of Indian plastics. The Plastics and Linoleum Exports Council has been playing a dynamic role in stepping up the export of this non-traditional item.

Exports of plastics materials are given in Table 1 and that of semi-finished plastics products in Table 2.

Imports

The plastics processing industry in the country is growing so fast that despite a rapid increase in the indigenous production, large quantities of plastics raw materials are being imported annually (Table 3). The raw materials that are imported at present are cellulose nitrate and cellulose acetate sheets, cellulose acetobutyrate (CAB) moulding powder, polypropylene, nylon and special compounds of plastics resins for specific end-uses. Some quantities of major thermoplastics like LDPE, HDPE, polypropylene, etc. are also imported. It will go on for some more time to come as the the gap between demand and indigenous output during the next year will be around 10,000 tonnes in the case of HDPE, 20,000 tonnes of LDPE and 13,000 tonnes of PVC resin.

The auxiliary materials that are imported for use by the plastics processing industries are anodizing

colour-coated-metallic foils for laminates, pigments, UV absorbers, blowing agents, etc. Import of plastics products is given in Table 4 [Wlth India - Ind. Prod, VII, 1, 21-23; Chem. Ind. News, 1978, 22(10), 727; Venkatasubramanian, Commerce, 1976, Dec. 31, 1; B.S., 20.4.78; Sarma, Capital (Suppl), 1976, Aug. 12, 85; Pop. Plast., 1977, 22(12), 32; Plast. Ind., 1978, 3(6), 11; Hindu Surv. Indian Ind., 1977, 119; Information from the Directorate General of Technical Development, New Delhi].

TABLE 1 - COMMODITY-WISE EXPORTS OF PLASTICS RAW MATERIALS

(Qty in tonnes; val. in thousand Rs)

	1974-75		1975-76		1976-77	
	Qty	Val	Qty	Val	Qty	Val
Epoxy resins	4.43	103.5	360*	29.87	48.66	845
Nylon moulding powder	-	-	-	-	1.81	154
Phenolic resin	-	-	2.5	33.13	2.46	91.25
PF moulding powder	32	212	5.25	32.45	42.5	243
UF moulding powder	1.16	8.83	2	10.7	-	-
Acrylic resin	21.98	156	1.5	12.8	5.89	54.66
HDPE resin compound	12.57	19	-	-	2.97	41.55
LDPE resin compound	204	2,738	50.87	564	55.33	501
Polystyrene moulding powder	3.15	48.8	131*	4.68	13.11	244
PVC compound	733*	20.88	61*	2.59	20.23	2,234
PVC resins (by emulsion)	-	-	-	-	1.5	13.9
PVC resins (by suspension)	-	-	-	-	1.1	54.52
PMMA moulding powder	-	-	131*	4.68	-	-
MF resin	-	-	33	333	-	-

*In kg.

TABLE 2 - EXPORTS OF SEMI-FINISHED PLASTICS PRODUCTS

(Qty in tonnes; val. in thousand Rs)

	1974-75		1975-76		1976-77	
	Qty	Val.	Qty	Val.	Qty	Val.
Black cast phenolic sheet, rod, tube	2.05	37.94	-	-	139.32	3115.64
Polyacrylate sheet	-	-	1.3	14.47	1.14	55.14
Methacrylate sheet, rod tube	-	-	22.88	215.44	14.91	100.97
Polyethylene sheet	24.28	46.81	26.49	222.78	98.39	927.57
Polyethylene rod, tube	126.15	1,358	90.47	813.88	362.55	3,453
Vinyl plastics film, sheet, ribbon	31.66	311.50	185.63	1,619	373.20	3,231
Vinyl plastics rod, tubes, filament	127.46	1,425	61.67	616.6	481.29	3,939
CA or CAB sheet, rod tube	-	-	-	-	447*	1,193

*In kg.

TABLE 3 - COMMODITY-WISE IMPORTS OF PLASTICS RAW MATERIALS

(Qty in tonnes; val. in thousand Rs)

	1974-75		1975-76		1976-77	
	Qty	Val.	Qty.	Val.	Qty	Val.
Acrylic resins	780	4,231	1,140	5,591	402	1,925
C.A. flakes	335.1	1,738	335	1,935	147	754
C.A. moulding powder	90	400	332	3,029	42.23	31.38
CAB moulding powder	298	3,375	223	3,469	230	2,235
Epoxy resins	115	216	16.82	588	13.06	678
Maleic resin	40.0*	415+	-	-	2.0	29.09
M.F. resin	0.2	7.95	-	-	3.84	20.88
Nylon moulding powder	640	8,537	452	4,567	507.6	6,772
Phenolic resins	101	438	13	289	7.08	131.13
P.F. moulding powder	4.0	25.68	1.10	50.84	5.85	58.61
P.F. resin	-	-	8.47	138	-	-
Polyacrylate moulding powder	512	2,966	145	822	32.73	341.49
LDPE	675	5,678	1,512	8,404	8,544	4,69
HDPE	3,153	1,945	7,376	31,193	8,193	4,455
PMMA moulding powder	115	898	491	2,298	435	383
Polystyrene moulding powder	160	1,292	416	2,745	254	1,816

contd...

TABLE 3 - Continued

lyvinyl acetate ulding powder	205	2,464	288	3,086	36.77	616
C compounds	372	2,847	105	1,031	81.62	1080
C resins y emulsion)	661	4,448	192	1,197	91.78	735
C resins y suspension)	45	649	213	1,498	217	1,586
licones	138	2,515	238	4,500	180	4,92
F. moulding wder	96.20	312	83	391	2.12	35
nyl resins, n.e.s.	270	3,687	103	1,857	595	7,924

In kg.

In Rs.

TABLE 4 - IMPORTS OF SEMI-FINISHED PLASTICS PRODUCTS

(Qty in tonnes; val. in thousand Rs)

	1974-75		1975-76		1976-77	
	Qty	Val.	Qty	Val.	Qty	Val.
Phenol formaldehyde resinous rod, tube	51*	4.10	1.69	45.74	2.74	174.99
Black cast phenolic sheet, rod, tube	6.72	137.93	10.02	220.65	25.69	510.64
Polyacrylate sheet	139.49	914.18	253.25	1,587	166.52	954.51
Methacrylate sheet, rod, tube	122.35	1,528	249.77	1,911	138.05	1,215
Polypropylene sheet	1.33	28.66	17.24	321.07	11.44	172.93
Polyethylene rod, tube	4.21	168.25	1.26	41.65	1.17	29.66
Vinyl plastics film sheet, ribbon	543.86	8,646	652.94	13,606	191.57	6,736
Vinyl plastics rod, tube, filament	37.93	1,089	5.49	232.36	9.42	268.25
CA or CAB sheet, rod, tube	191.16	2,119	232.00	2,108	34.06	753.76
Cellulose nitrate sheet, rod, tube	340.62	8,371	383.92	9,909	207.45	6,838

*In kg.

2. INDUSTRIAL NEWS

1 GENERAL

1.1 Industrial Growth Up - Morning, it is said, shows the day. If that be so, the 7% industrial growth rate during the first 2 months of 1978-79 should be encouraging - specially when compared to the overall growth of 4% during the previous financial year.

It is heartening that the priority sector is the main contributor to the growth rate. For example, tractor output is up by 40%; heavy industry products by 15%; and textile, the single largest industrial sector, has picked up a growth rate of 3-4% compared to the utter slump of 1977-78. Sugar production has hit a new all time high of 68 lakh tonnes during April-May 1978. With the better availability of component and more labour productivity, the production of commercial vehicles is looking up.

The increase in industrial growth rate is a direct result of the increase in power generation during April (+14%) and May (18%). At this rate experts expect that the overall growth of power generation during the year will be 11-13% thus sustaining the industrial growth at the current rate.

However, it is not roses all the way. The core sector is yet to overcome its problems. Steel output

fell by over 2 lakh tonnes from its two-month quota, coal raising is lagging and cement situation is enigmatic. Rail movement is plagued by bottlenecks. However, the Industry Ministry is aware and is taking remedial measures. As one of these measures, it is coaxing the Finance Ministry to cut import duties on several items in short supply (T.I., 11.7.78).

2.1.2 World Bank and Small Scale Sector - A recent World Bank Sector Policy Paper on Employment and Development of Small Enterprises has done well to draw attention to the fact that within the small scale sector there are some non-manufacturing enterprises such as building construction, transport, agricultural processing, etc. which could also be extended the financial benefits hitherto available to the others in the small sector. The World Bank distinguishes three categories: (i) small manufacturing firms that are relatively modern; (ii) enterprises not conducted in a "modern" manner, in the "informal" sector as cottage and village industries; and (iii) organized non-manufacturing firms.

The World Bank has so far shown interest in assisting the small sector through developmental financial companies (DFCs), and the assistance given by it in 1977 was $ 50 million. But in future the Bank will pay greater attention

to this sector and plans are to raise such assistance to $ 300 million a year by 1981. This assistance can be easily obtained through DFCs, commercial banks or other similar government agencies. The Bank is of the view that more constructive and flexible lending criteria might imporve the status of the small scale enterprises; and increase the survival rates of the infant enterprises.

The small scale ventures of the artisans and informal enterprises could be better benefitted by the Bank if a joint organization or support services could be established to provide them integrated package of assistance. Thus, the overhead costs could be spread over a number of formerly decentralized units, and they could reach longer markets, increase and upgrade production capacity and be a better credit risk for the banks.

The success of the World Bank's experiment will depend on how DFCs and the governments react to its message, because the Bank itself can cover the financial needs of the small enterprises only partially [Commerce, 1978, 136(3495), 944].

.3 "Small" Marketing - A separate marketing wing in small scale ventures is usually a rare phenomenon. The entrepreneurs who run the show are usually unable to concentrate on the marketing function; they prefer to get bulk orders

from a couple of big consumer industries rather than expanding their markets. According to Dr. Sudhir Bhave, who conducted a survey of the small units in Pune region, it pays the small entrepreneur to adopt the expansion of the markets without involving a considerable budget, and to plan the marketing technique.

Planned marketing will help sales, margin of profits and make advance financial arrangements for product promotion. Care must be taken to allocate a percentage for marketing, and to have a proper follow up action.

There are units using mixed channels of marketing. They would sell directly to the consumers locally and appoint agents in other areas. These units could effect a better control over the sales. But units exclusively selling their products through sole agents are not always prospering. They could not implement freely new policies and new technique of product promotion; nor could they effect price changes according to the varying cost of the inputs. Therefore, it is desirable to have an elastic and flexible marketing structure.

Formation of a consortium by many units producing the similar items would be a better solution. Small electronic equipment units in Delhi have formed a similar consortium and have progressed well to capture three-fourth of the market within five years.

It is preferable to have a common brand name, advertisement programme, distribution agencies, system of discounts and pool of funds for designing and developing their products. Strengthening of the sales efforts would make it easier to face competition [Industrial Times, 1978, 20(12), 5].

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2 ENGINEERING INDUSTRY

2.1 Live Jointing of Cables - A radically new system for the live jointing of service connections to main supply cables has been introduced by a British firm and marketed under the name of SAFE-T. The method is based on ring connector principles, and is quick, economical and versatile. The system is designed to join up to 6 single-phase or upto 2 three-phase main cable. It is suitable for use up to 1000 V in paper or plastic insulated cables with copper or aluminium conductors: main cables up to 300 mm^2 and service cables up to 35 mm^2.

The connecting procedure consists of fitting the service cables first and then the main conductor. No insulation is removed from the main cable except by the cutting screw operated by the fully insulated socket screw wrench. The outer sheath of the main cable is stripped and

spacers are inserted between the cores. A harness screw is removed and the connector is wrapped round the cores. After replacing the harness screw, the terminal and the dummy units are tightened onto the cores.

The service cables are then connected and the cutting screw of each terminal unit is operated by the insulated wrench until contact is made with the main conductor and the socket of the screw becomes rounded. Next, the lower half of the joint shell is placed in position under the joint, after foam strips have been placed round the cable sheath to seal the entries. Finally, the two halves of the shell are fitted together with clips and edge strips. The filling compound necessary for each particular joint is poured into the shell /"J. Inst. Engrs (India), 1978, 27(11), 25 7.

2.2.2 Mobile Concrete Pump -- A trailer-mounted concrete pump developed by Ritemixer Ltd, Darwin Close, Reading, Berkshire, England, offers an economical means of placing concrete over long horizontal and vertical distances. In actual operation, the pump has delivered concrete at the rate of 20 m^3/hr to the 16th floor of a building, 48 metre above the ground.

The pump can handle a wide variety of concretes with aggregates up to 50 mm. Standard equipments include

reducing pipe and hose sections for the gradual channelling of the flow emerging from the pump's 150 mm dia. discharge adopter into 125 mm and 100 mm dia. delivery pipes, and 45° elbow units and snap-on couplings with corresponding diameters. Reducing units enable shorter diameters and, therefore, lighter delivery hoses to be used (Eng. Times, 13.4.78).

2.3 New Diecasting Technology - A new diecasting technology has been developed by Australian Zinc Development Association. This is claimed to be cheap and better than the already available technologies. It is based on a thin wall technology developed a couple of years ago.

As our two wheeler automobile industry is entrenched firmly, there is considerable scope for increasing zinc consumption in the diecasting sector. If this technology is made use of then there is enough scope for the diecast machine parts in the export markets (I.E., 11.6.78).

2.4 Automatic Soldering - A new automatic printed circuit board soldering machine has been developed in Switzerland. This machine is useful for both batch production and continuous mass production. Maximum soldering width is 327 mm and rejection rate is one in thoudand.

The unit includes automatic flux refill and ingot feeding, a pump to cover the solder with an oil film to

prevent oxidation, and a built-in exhaust system. The unit uses foam fluxing, infrared preheating and hollow wave soldering (Hindu, 8.5.78).

2.2.5 Low Cost Grinder - A low-cost grinding machine developed specifically for re-sharpening tools used in the wood working, plastics and allied industries has been introduced recently in England. This is smaller, less expensive and less complicated in comparison with universal grinding machine.

The machine enables edge tools such as router cutters, dowel drills and various types of boring bits to be re-sharpened quickly, and in quantity, with degree of precision. Both tungsten carbide tipped (TCT) and high speed steel (HSS) can be accommodated (Hindu, 15.5.78).

2.2.6 Car Fuel Saver - Electronics Corporation of India Ltd (ECIL), has developed an electronic ignition system for use in automobiles like Premier and Ambassador. The ignition system made entirely of indigenous components, is compact and gives an increased fuel economy of 10-14% than conventional ignition systems. The device is fitted near the dashboard of the vehicle and is so designed that a change over to the conventional ignition system could be effected instantaneously by using a switch.

The ignition system offers advantages like easier starting and smooth acceleration. Since the system makes use of the capacitor discharge principle, no direct current flows through the ignition coil. The coil does not heat up and therefore vehicle breakdown in summer due to ignition coil heating can be avoided. The drain from the battery is also reduced by about 40% thus prolonging battery life. Starting is also easier. Even at low battery voltages, the ignition system supplies sufficient energy for the vehicle to start [Commerce, 1978, 136(3496), 964].

2.7 Flame Hardening Burner - A new design of flame hardening burner has been developed by Sree Bhuvaneswari Enterprises, Harihar (Karnataka). The burner made of rolled brass is designed for simultaneous heating and quenching. There are two chambers for oxy-acetylene gas and water. Heating through the gas chamber will be simultaneously followed by quencing through water chambers.

The burner will be made to order depending upon the width of the surface to be hardened. Further particulars can be had from: Sree Bhuaneswari Enterprises, No.E/2, Ist Phase Labour Colony, Yantrapur Post, Harihar-577602 [Chem. Take-off, 1978, 7(5), 8].

2.2.8 Electronic Yarn Cleaner - A complete electronic yarn cleaning system based on opto-electronic principles has been devised by Marathe Engineering Industries, Miraj. This will replace conventional slub catchers for yarn cleaning. The use of modulated infra-red light system for sensing and modern integrated circuitary for detection helps in reliable detection and in removing unwanted thick places including smallest size neps to thick ends and spinners' doubles.

The yarn cleaner consists of centralized control unit, which controls ten spindles, and an amplifier-sensor unit for individual spindle. It controls the thickness and the percentage of average diameter of yarn. Thick ends and spinners doubles are removed if they overstep the limitting values.

The total number of cuts for the centralized control unit is recorded on a 6 digit electro-magnetic counter. The settings on the control unit can be reproduced on any other control unit [Man-made Textiles in India, 1978, 21(5), 258].

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CHEMICAL INDUSTRY

1 Alkaloids export - The Indian Institute of Foreign Trade has advocated the formation of a consortium for exporting alkaloids like berberine hydrochloride to Japan.

In a study conducted by the institute it is pointed out that India enjoys the advantage of being a monopoly supplier to Japan and this trend can be maintained comfortably at least for another decade. However, the market for this product may not expand tremendously and the growth might be steady since the absorption is reaching the optimum level.

It is estimated that by 1980 the demand may be in the neighbourhood of 30 tonnes. If it is assumed that Japan's production in 1980 does not exceed 10 tonnes then there is a likelihood of imports going up to 20 tonnes from the present 13 tonnes. In 1974-75 India's total exports amounted to Rs 10.5 lakh as against Rs 5.91 lakh earlier with Japan accounting for 94 per cent of the exports.

Though India is a monopoly supplier it has not exploited its position by escalating the product's price. As a matter of fact, the study notes, there has been a steep decline in the export price mainly due to inter se competition. While there are about a dozen firms

exporting the commodity to Japan, there is only one buying agency in that country, which is able to exploit the competition among the Indian firms and bargain for lower prices.

Inter se competition among exporting firms here has knocked off all the benefits that accrue to a monopoly supplier and hence it is imperative that exporters quote a single price and scrupulously avoid competition. If this fails or exporting firms do not successfully unite then as a last resort this item should be canalised through either the State Trading Corporation or the National Co-operative Marketing Federation (NAFED), IIFT.

Berberine hydrochloride is used to produce medicine for curing gastro-intestinal disorders. This is preferred to other antibiotics as it does not produce any side effects. Japan is the biggest market for this herb (E.T., 1.5.78).

2.3.2 NCL Process for Ethephon - Ethepon is an important plant growth regulator. By its application, rubber latex yields can be increased by 200-300%. It can change the female-male flower ratio in many plants. It is also used for maturing and ripening fruits in many plants. It is reported to increase the yield of certain cereals. So far such growth regulators were imported and then formulated in India.

National Chemical Laboratory (NCL), Poona, has developed a process for the manufacture of ethephon. The following steps are involved: (i) preparation of 2-chloroethyl phosphite from phosphorus trichloride and ethylene oxide; (ii) isomerization of 2-chloroethyl phosphite to diester of phosphonic acid; and (iii) the diester of phosphonic acid is de-esterified to dry hydrochloric acid gas to yield ethephon.

Phosphorus chloride, ethylene oxide, hydrochloric acid, and sulphuric acid are the main raw materials required for manufacture of ethephon. All are indigenously available. The equipments required are: distillation condensers, bubblers, stirrers, heating mantles and chilling units. All of these are also indigenously available.

Further particulars can be had from: The Director, National Chemical Laboratory, Poona [Econ. Commerc. News, 1978, 8(22), 11].

3.3 Sulphur Unit - India's first ever plant, costing Rs 1.75 crore, with a capacity of 25 tonnes to manufacture sulphur from gypsum will be set up in Kashmir by the Fertilizer Corporation of India.

Gypsum occurs in the Baramulla area of Kashmir valley and Ramban tehsil of Jammu province. The

deposits are estimated at 65.72 million tonnes and 28 million tonnes respectively, their purity assessed at 92.96% (E.T., 24.6.78).

2.3.4 <u>Kerala Chemicals & Proteins</u> - Kerala Chemicals & Proteins Ltd., a new company incorporated in April 1975 in the State of Kerala proposes to set up a plant for the manufacture of 2210 tonnes of Ossein and 4250 tonnes of Dicalcium Phosphate. The plant will be located at Kahtikudam, Kallur Vadakummuri village, Trichur District, Kerala.

The promoters of the company are Kerala State Industrial Development Corporation, Nitta Gelatine Co. Ltd., Japan and Mitsubshi Corporation, Japan.

The company has entered into technical collaboration agreement with NITTA and sales agreement with Mitsubshi. NITTA will supply technical know-how including confidential engineering data, drawings, technical information and will train the company's engineers (maximum five) at their works in Japan. Mitsubishi shall purchase the entire production of Ossein for five years from the commencement of commercial production. The total cost of the project is estimated at Rs 320 lakh.

The demand for the products is expected to grow both in home market as well as in foreign market

especially in Japan because they are used in developing industries like edible food, photographic film, pharmaceutical preparations, toothpaste and fertilizers (E.T., 2.5.78).

3.5 <u>No New Pesticide Capacity</u> - No new capacities in pesticides formulation will be created until the existing capacities of the small sector are fully utilised.

This assurance was given by Mr. H.N. Bahuguna, Union Minister for petroleum and chemicals to a delegation of the pesticides wing of the National Alliance of Young Entrepreneurs (NAYE).

The minister said that new capacities could be created only in highly technological fields and in such areas where the existing pesticides formulators were unable to service the demand of the farmers. Mr. Bahuguna asked NAYE to prepare a comprehensive paper on the availability of raw material and utilisation of the capacities and the future demand projections.

According to a NAYE press note, the existing utilisation of capacity in the small sector was barely 25 per cent. At present there was an acute shortage of all important technical materials like BHC technical, DDT, endosulfan and carbaryl etc. The cost of the formulated material depended on the price of the technical material

and unless the government helped to reduce the price of the raw material prices of formulated products could not come down (E.T., 17.5.78).

2.3.6 Wide Width Plastic Film Project - India's first project to manufacture Low Density Polyethylene Wide Width Film (LDPE) has been set up at Parwanoo, Himachal Pradesh by Shivalik Agro-Poly Products Ltd. This plant with a capacity of 3,000 tonnes per annum will produce various grades and sizes of transparent or coloured films having a width of 10-12 metres. Raw materials required are indigenously available and production will start in August/September 1978.

The wide width film will be useful for both civil and military construction applications. In agriculture it can be applied for conserving water resources through canal, channel or pond lining, water/moisture proof storage bins, army tentage replacing tarpaulins, hilly and tropical climate roofing, prevention of seepage of sub-soil water in buildings, etc. It is interesting to note that, when used in reservoir lining, water loss through seepage could be prevented to the extent of 40-60%. The cost per sq. metre is much lower than that of traditional lining materials [Industrial India, 1978, 29(2), 48].

MISCELLANEOUS INDUSTRIES

.1 Bricks from Desert Sands - Sand dunes are a constant nuisance to a large chunk of Rajasthan. The desert extends from almost Sikar district to Barmer all along the border. This curse to the people can be turned into a boon. This is what a proposed project for making bricks from sand in Churu district of Rajasthan envisages.

The project of utilising this inexhaustible material sand - is part of an area development plan for Sridungargarh cluster of villages prepared by Mr. B.L. Vyas of the Council for Application and Extension of Technology to Rural India.

Mr. Vyas who has already obtained technical feasibility reports from expert concerns in UK and West Germany is now engaged in arrangements for finance. The project prepared for him by the Central Building Research Institute, Roorkee, estimates an outlay of about Rs 65 lakh for a project which could produce about 2 crore bricks per year.

Samples of sand and limestone were sent for testing to a firm each in UK and West Germany who prepared bricks from them and certified that the material was quite suitable for making bricks.

Mr. Vyas said that these bricks will be sturdier and would cost less by 50 per cent than the conventional

bricks. The conventional bricks made from clay have a strength of 80 to 100 kg. per cubic centimetre and selling price ranges between Rs. 300 to 350 per 1000 against sand-lime bricks at Rs. 150 per 1000 with a strength of 360 kg. per cm.

More over the bricks have a better finish and can be made up to one metre in length. They also have the advantage of being produced in any shape and colour.

He claims that such a project employing more than 200 people directly will generate further employment potential through building and transport activities since cheaper bricks will enable the villagers to construct pucca houses.

The Rajasthan State Industrial and Mineral Development Corporation has shown some interest in the project and he is in the state capital discussing it with concerned authorities(E.T., 4.6.78).

2.4.2 Asia's Biggest Air Separation Plant - The largest air separation plant in Asia has recently been successfully erected by Indian Oxygen Ltd at Sindri. This plant is a part of the Fertilizer Corporation of India's Sindri Modernisation Project. The erection of this gigantic plant is the first major step in the commissioning of the Rs. 152 crore project which is being implemented in

collaboration with the World Bank. On completion, the project will enable Sindri to increase its nitrogenous capacity from 1.17 lakh tonnes to 2.52 lakh tonnes of nitrogen annually. This, in turn, should yield an additional 3 million tonnes of food grains and save foreign exchange of around Rs. 100 crores annually.

The Air Separation Plant is 35 metres high and has a capacity to handle 160,000 Nm^3 per hour of air and can produce 52,300 Nm^3 of pure nitrogen at different pressures and 24,000 Nm^3 of oxygen per hour. The Plant plays a vital part in ammonia synthesis by providing nitrogen for mixing with hydrogen. It separates hydrogen and oxygen from air fed into it from the air compressor.

The erection work involved more than one thousand tonnes of equipment and pipework. FCI's foreign consultants set up rigid standards for the materials used and welding work carried out by IOL's experts [Industr. Times, 1978, 20(12), 53].

.3 Wire Ropes - Usha Martin Black (Wire Ropes) Ltd., plans to set up a Rs. 7.50 crore joint venture in Yugoslavia for the manufacture of 5200 tonnes of steel wire ropes per annum. A protocol to this effect has been signed with the Yugoslav firm, Unis-Associated Metal Industry. The company has sought the government's

approval to the proposed joint project.

The company's wire rod mill with an installed capacity of 50,000 tonnes being established at Adityanagar, near Jamshedpur, is likely to go on stream by 1978 end. The financial institutions have sanctioned term loans of Rs. 313.96 lakh, of which the company has received Rs. 166.96 lakh as bridge finance. The company has taken steps to implement the industrial licence for the manufacture of 1,200 tonnes of large diameter wire ropes at its Ranchi plant. It has also obtained licence to continue to manufacture 12,000 tonnes of steel wires (E.T., 3.6.78).

2.4.4 Acrylic Fibre Plant - Mr. H.N. Bahuguna, Union Minister for petroleum and chemicals has informed the news circle that the Union Government has decided to set up a plant in public sector to manufacture acrylic fibre in collaboartion with Japanese firm at Baroda. The plant will be of 1000 tonnes capacity. He added that the industry would be protected and proposal for direct sale or allotment of fibre to industry or to small scale sector out of acrylic production from the above plant would be favourably considered (E.T., 4.5.78).

2.4.5 Gem and Jewellery Exports - Export of gems and jewellery has crossed the target set for 1977-78 by over 33 per cent, although the final figures are yet to be received -

the estimates show that the value of exports have touched Rs. 400 crore mark, Rs. 100 crore more than the target set.

Gem and jewellery exports during the period April-December, 1977 ammounted a record high of Rs. 323.65 crores as against Rs. 179.98 crores during the corresponding period in the previous year - a rise of nearly 80 per cent.

The export of diamonds, the leading item of exports representing about 92 percent of all gem and jewellery exports effected during the period April-Decemner 1977, amounted to Rs. 301.51 crores as against Rs. 152.22 crores during the corresponding period in 1976.

Other items, exports of which increased during April-December, 1977 as compared to April-December 1976, were gold jewellery (62-92 per cent), non-gold jewellery (61.65 per cent) and synthetic stones (48.29 per cent).

Belgium was the leading buyer of India's gems and jewellery (chiefly cut and polished diamonds) during April-December, 1977 with purchase worth Rs. 100.29 crores, followed by the USA (Rs. 80.98 crores), Hong Kong (Rs. 42.30 crores), Japan (Rs. 27.08 crores), Netherlands (Rs. 120.05 crores) and Switzerland (Rs. 11.98 crores).

The recent decision of the Government of India to evolve a scheme where by gold would be supplied to exporters at international prices will, when implemented,

help give a further boost to gem and jewellery exports. It is estimated that, considering the demand for Indian gold jewellery in many parts of the world and particularly in West Asia, gem and jewellery exports by year-end 1978-79 may easily cross the Rs. 500 crore mark.

A move just made by the Government is removal of obligation to buy 20 per cent of the replenishment entitlement for rough diamonds from the MMTC. This was a long standing demand from the trade. The move will surely help the faster growth, of exports since the MMTC has never been able to supply goods of the right quality at the right price.

The Government has already exempted diamonds and semi-precious stones from the levy of import duty. This is bound to give a boost to export of these items.

If the Government also removes the import duty on pearls, precious stones and synthetic stones, it would help raise gem and jewellery exports still further. It is hoped that the Government will take an early decision in the matter.

A development that may have far-reaching consequences for our diamond exports, however, is the recent decision by the Diamond Trading Company (DTC), London, to impose a surcharge of 40 per cent on all diamond roughs supplied

by it for the March 1978 sight. It is not known whether the DTC will continue the surcharge on the coming sights also it is also too early to assess the likely impact on the demand for polished diamonds in the world diamond markets, following the enhancement in diamond rough prices (B.S., 23.4.78).

3. ANNOUNCEMENTS

3.1 AWARDS

3.1.1 Bhusawal Power Station Wins Award for Best Performance in 1976-77 - The Bhusawal Thermal Power Station of the Maharashtra State Electricity Board has been awarded a cash prize of Rs. 50,000 and a running shield for its best performance in the country for the year 1976-77, in the category of 50 MW - 199 MW capacity stations.

The prize is being awarded in pursuance of a decision taken in the conference of the State Power Ministers held in New Delhi in May 1975. In this conference, the Deptt. of Power, Ministry of Energy, formulated a scheme for giving awards annually to the thermal power stations in the country on the basis of best performance, to be adjudged by the awards committee set up by this Ministry.

The cash prize is to be utilized for educational, health, nutrition and community welfare measures for employees of the concerned power stations and their families.

The performance of the MSEB power station has been showing steady improvement over the last 3 years. The average performance during the years 1975-76, 1976-77 and 1977-78 had been respectively at 5323, 5507 and 5942 Kwh/Kw. The performance has thus reached a

maximum of 5942 Kwh/Kw, which is one of the highest in the country. This is almost around the optimum target fixed by the Central Electricity Authority of 6000 Kwh/Kw.

1.2 Science Awards for 1976 - The names of 12 scientists who are to receive the 1976 Shanti Swarup Bhatnagar prizes have been finally announced by the governing body of the Council of Scientific and Industrial Research.

Instituted in 1958, this prestigious prize that carries an award of Rs. 10,000 for each of the scientists selected for a year for outstanding fundamental research in disciplines of science or engineering and technology.

Prof. C.K. Majumdar of Calcutta University and Prof. R. Vijayaraghavan of Tata Institute of Fundamental Research, Bombay, have been jointly named for the award in physics. The honour for biological sciences is similarly shared by Dr. Krishan Singh of Indian Institute of Sugarcane Research, Lucknow and Dr. C.P. Dutta of Central Drug Research Institute, Lucknow.

The chemistry award goes posthumously to the late Prof. D. Devaprabhakara of the Indian Institute of Technology, Kanpur.

In engineering and technology, the award is again jointly given to Dr. Rajinder Kumar of department of chemical engineering at the Indian Institute of Sciences,

Bangalore and Dr. V. Rajaraman of the department of electrical engineering and computer sciences, IIT Kanpur.

Dr. R.N. Moudgal of the Indian Institute of Science, Bangalore, is to receive the prize for his contribution to medical sciences.

Other awards to be jointly shared include, for mathematical sciences by Prof. K.R. Parthasarthy of the Indian Statistical Institute, Delhi, and Prof. S.K. Trehan of Punjab University, Chandigarh, and for earth sciences by Dr. M.K. Bose of Presidency College, Calcutta, and Dr. K.S. Valdiya of Kumaon University, Nainital.

3.1.3 FICCI Awards, 1978 - FICCI invites nominations for its 1978 awards for excellence in and outstanding contributions to the following:

Companies & Institutions: Research in Science and Technology; Rural development; Training and placement of disabled persons.

Individual Scientists/Technologists

Three cash awards of Rs. 10,000/- each in Life Science including Agriculture, Physical Sciences including Mathematics and Technology with particular reference to its inter-action with industry.

The last date for nominations is Monday, the 18th September 1978.

For further details, contact Secretary-General, Federation of Indian Chambers of Commerce & Industry Federation House, Tansen Marge, New Delhi.

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TRAINING

1 Management Education Programme - The Indian Institute of Management, Ahmedabad is organizing this programme during (first week of November 1978 to first week of April 1979) for executives who are in the middle levels of management and are likely to shoulder responsibilities for general management within the organization. It seeks to prepare the executives for higher responsibilities by giving them the necessary concepts and tools and by developing skills and attitudes essential for general management.

No formal academic qualifications are prescribed. But, a good working knowledge of written and spoken English and familiarity with basic mathematics are essential. Organizational sponsorship is essential.

Last date for application is fixed as : September 15, 1978.

For details write to Dr. V.L. Mote, Chairman (MEP), Indian Institute of Management, Ahmedabad-380015.

3.3 PUBLICATIONS RECOMMENDED

3.3.1 Minerals and Metal Review : Annual 1978, Editor, M.P. Narayana Pillai; Asian Industry and Information Services Pvt Ltd, 12/18 Vithalbhai Patel Road, Bombay-400004; Pp 136; Price Rs.10; Annual subscription Rs.75.

This annual number contains authoritative articles and surveys on copper, coal, iron ore, lead, zinc, tin, aluminium, steel, nickel, manganese ore etc. It gives a comprehensive account of the product data for both India and the world. The problem of metals and minerals covered by the annual have also been dealth with adequately.

3.3.2 Refractory Industry in India - Directory-cum-Manual - 1978 - Secretary, Indian Refractory Makers Association, 6, Netaji Subhas Road, Calcutta; Price Rs 20.

This is the second edition of the Directory of Refractory Industry in India - 1974 brought out jointly by the Refractory Makers Association and DGTD. The Directory incorporates entries on various refractories in India giving their history of development, present activities, future programmes, and production data. Besides this edition contains several new features such as data on units in small sector, sources of raw materials as well as of plant and equipment.

FAIRS

.1 Indian Engineering Trade Fair - The Association of Indian Engineering Industry is organizing its Third Indian Engineering Trade Fair during Feb. 2-16, 1979. The Fair will be bigger than the earlier ones and will provide opportunity to effectively project company image and reach out to prospective buyers the world over.

For details, contact the Secretary, Association of Indian Engineering Industry, 172, Jor Bagh, New Delhi-3.

.2 Indian Garments Fair 1978 - The Garments Exporter Association is organizing this Fair at Hotel Mourya, New Delhi during September 13 to 15, 1978 to attract foreign buyers for the spring/summers' 79 collection. Participation is restricted to members only.

For details write to Garments Exporters Association, 609 Ashoka Estate, 24 Barakhamba Road, New Delhi-110034

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CONFERENCE

.1 The Tenth Indian Rubber Manufacturers Research Association Rubber Conference will be held in Thana inDecember 1978. Also a cash award of Rs. 10,000 will be given for the best fundamental research work in rubber technology which has been completed and published during the period April 1977 to March 1978.

3.5.2 A Symposium on Science of Catalysts and its application in Industry will be held at Sindri between February 22-24, 1979.

Further details can be obtained from: The Organizing Secretary, C.D.P. Department, The Fertilizer (P & D) India Ltd, P.O. Sindri, Distt: Dhanbad, Pin - 818122.

3.5.3 A National Design Engineering Conference organized jointly by the Indian Institute of Technology, Madras; Institution of Engineers (India) - Tamil Nadu Centre; and the Association of Indian Engineering Industry (Southern Region), cosponsored by the Department of Science and Technology, Ministry of Defence (R & D Organization), CSIR and several leading industrial establishments, will be held in December 1978.

Further details can be obtained from: Dr K. Lakshminarayana, Mechanical Engineering Department, Indian Institute of Technology, Madras-600036.

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3.6 Polymer Science Centre

The Syndicate of the Madras University are going to establish an institute of polymer science in Madras.

The objectives of the institute are to: carry out basic studies in the area of polymers both bio and

synthetic; make available its advance testing facilities to industry and establishments and consequently avoid the need for duplication of such facility; organize and conduct courses in polymer technology at diploma, graduate and post-graduate levels to train men for polymer, elastomer, fibre, surface coatings and adhesive manufacturing industries; enhance knowledge by way of assimilation, implementation and import of technology with specific correlation to the country; develop, disseminate and assimilate technology till now not available in the country; associate itself with institutions, industry and university to make horizontal transfer of technology possible and meaningful and render consultancy services to industries (Hindu, 6.7.78).

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INDUSTRIAL NEWS DIGEST

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PUBLICATIONS & INFORMATION DIRECTORATE, CSIR
Hillside Road, New Delhi-110012

INDUSTRIAL NEWS DIGEST

Vol.1 No.9 September 1978

al News Digest is a monthly bulletin by the Publications & Information rate. A part of the Industrial tion. Service of the Directorate, the ims at providing packaged, down-to-echnological and techno-economic tion to industrialists, prospective neurs, and experts in both government rivate agencies dealing with the ment and planning of industry. on technical and techno-economic are welcome.

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Publications & Information Directorate CSIR, Hillside Road, New Delhi 110012

1. INDUSTRY PROFILE

ndustry

V was introduced in India in September 1959 with the ng up of an experimental TV Centre at Delhi under an ation programme of UNESCO. However, regular transmission from this station was started only in ;. The second TV Centre was commissioned in ober 1972 at Bombay. This was followed in 1973 by a centre at Poona and a station at Srinagar. During 5 five more stations were commissioned at Calcutta, dras, Nadiad, Lucknow and Jaipur. Under INSAT gramme four more stations were set up in 1977 at our, Myssorie, Gulberga and Hyderabad. There are at ent 14 stations in operation covering roughly 5% of country's total area and 13% of the population.

lanufacture of TV receivers was taken up in the late 's. The first TV set was manufactured by J.K. tronics Ltd, Kanpur,in 1968. Initially, four firms, two ie organized sector and two in the small sector, were nsed to produce 10,000 sets/yr and 5,000 sets/yr ectively. Later, according to the guidelines laid down he Electronics Commission, further capacity for the nufacture of TV sets was created both in small and anized sectors. Licences in the organized sector were ed primarily to public sector agencies like state ustrial development corporations. A public sector lertaking, Electronics Corporation of India Limited, derabad, received a licence for 20,000 sets/yr. Thus, total capacity available to the large scale sector at sent is of the order of 105,000 sets/yr and is shared by units.

n the small sector, there are 59 units managed by hnically oriented entrepreneurs who had their footing he radio industry. In most cases, capacities approved individual units were 2,500 sets/yr. Some public sector encies like HP Mineral Development Corpn, UP Hill velopment Corpn and Orissa Small Industries Corpn re granted licences for 5,000 sets/yr each. The total acity in the small scale sector comes to 201,800, which counts for about 60% of the total capacity approved for manufacturers. The combined capacity of the two tors comes to 306,800 sets/yr.

There is scope for further expansion with marginal ditional capital equipment. The Department of ctronics has taken a view that the capacity of units in anized sector will be pegged at 20,000 sets/yr and those the small sector at 5,000 to 10,000 sets/yr. All units ing reached their existing capacity are allowed ansion to the higher figure.

duction

The production of TV receivers in India as in 1977 is 3,833. The production of TV sets in 1970 was a meagre 14,406 and it increased to 96,908 in 1975, and to 1,43,537 in 1976. Production figures of TV sets in India during 1970/77 are given in Table 1.

TABLE 1 - PRODUCTION OF TELEVISION RECEIVERS IN INDIA

Years	Total Production	Large Sector	Small Sector	Production of small sector as % of the total
1970	14,406	5,352	9,054	63
1971	16,007	7,800	8,207	51
1972	30,671	14,778	15,893	52
1973	75,066	28,339	44,687	60
1974	75,744	26,244	49,500	65
1975	96,908	43,513	53,395	55
1976	143,537	41,846	101,691	71
1977	238,883	-	-	-

The increased share of large scale sector during 1975 was mainly due to reclassification. After the announcement of differential excise duty system for TV sets in 1976-77 the small sector has performed better and their share in the total production has increased considerably.

Demand

With the TV broadcasting services already established and more in the offing, the demand for TV receivers is placed at 3 lakhs in 1979. The Electronic Commission has estimated the demand of TV sets by 1983-84 in terms of value at Rs 7,360 million.

Types of TV Sets

Production in the early stages of the industry was based on the hybrid design developed at the Central Electronics Engineering Research Institute (CEERI), Pilani. Later, a fully transistorized model was developed by a public sector unit. A few manufacturers have also adopted the design of TV sets from western countries with some modifications. The TV receivers available in the market could broadly be categorized on the basis of circuitry used by them as follows: (i) fully based on electronic valves, and (ii) hybrid sets using 4 to 8 electronic valves, and (iii) transistorized sets. More than 75% of the TV sets in India utilize hybrid circuitry mainly because the component cost for these sets is much less than that for the transistorized models. One unit in the small sector is using electronic valve circuits only. Both single and multichannel sets are being manufactured in the country.

As regards screen sizes, TV sets with 31/36 cm and

48/51 cm are being assembled in the country. The department of Electronics have however recommended 51 cm size for domestic viewing and 59/61 cm size for community viewing as in SITE programme. The consumer preference has been for 48/51 cm size.

Availability of Components

TV sets are being assembled mostly from the components available indigenously with little import. The first TV set produced in India had about 15 per cent imported components. A high degree of import substitution has, however, been achieved during the course of time, resulting in bringing down the import content to Rs 50 per set at present as compared Rs 90 in 1973. The list of items allowed for import is also periodically revised in step with the progress of the components industry. The import content of an indigenously assembled TV receivers, in strict sense, is much more as the TV picture tube industry imports TV glass shell and chemicals at a price of Rs 120 per picture tube and TV deflection components industry uses imported materials/components worth Rs 10 cif.

The import requirement (actual user licence issued under Import Trade Control Policy) by TV manufactures assembling sets with hybrid circuitry is actually less than Rs 15 cif as only certain resistors and UDRs are being imported, while for sets based on solid state circuitry it is about Rs 35 cif for which diodes and transistors are also imported. The balance amount of AU licence is generally used for importing deflection components, picture tubes and tuner parts. Television picture tubes are being manufactured by Bharat Electronics Ltd, Bangalore. BEL has set up another unit at Gaziabad. At present BEL is producing 120,000 tubes against its licensed capacity of 200,000 tubes. Two more units, Asian Electronics, Nasik, and Satish Koura, Delhi, have been granted licences to manufacture 20,000 and 40,000 picture tubes per annum.

Manufacture of deflection components started as late as 1972 when licences were given to individual manufacturers. Currently, the total licnsed capacity per annum is 730,000 units which is distributed over 31 manufacturers. The share of the organized sector is 100,000 units/yr. At present, 13 manufacturers are in production which account for 342,000 units per annum. Majority of manufacturers have invested in automatic and programmable winding machines, their installed capacity, even on single shift basis, is twice as much.

Quality Control

In majority of the TV units, the quality control excercised by the manufacturers is poor. Manufacturers have opted for the level of quality which is convenient to them and suits the economies of their production rather than that which best meets the needs of the consumer.

The Indian Standard Institution prepared a standar for performance of TV sets (IS:4547) way back in 196 Methods of measurement of receivers for monochrom television braodcast transmission, and methods o measurement of radiations from TV receivers, were als brought out in the same year (IS:4545 and IS:4546). Th National Physical Laboratory is equipped to carry ou majority of the test presented in these standards. Th facilities available at NPL are such that each set woul require at least a month to be tested for the entire range o climatic and electric tests. Though, these test facilities ar obviously inadequate for use on a commercial basis, th manufacturers too have not shown any initiative fo creating better test facilities. The TV sets manufacturer should realise that a better quality control exercised in th factory would not only go a long way in cutting down th number of after sales complaints but also a reductio servicing overhead and a better brand image. In the cas of components, a quality assurance in the form of IS marks should be enforced.

Problems

The main problems which have confronted the T industry ever since its inception are the escalation in th prices of finished sets due to increased prices of inpu materials, increase in direct/indirect taxes, and the poo offtake of TV sets. The exfactory price which was Rs 165 in 1973 increased to Rs 2250 by 1975. To this there wer added excise duty, octroi, sales tax of the order of R 1,000.

The first step towards reducing the prices and en couraging production of lower cost utility oriented T sets in India was taken up with an announcement in th Union Budget for 1976-77 of a differential duty structur on TV sets whereby TV sets having a unit value of Rs 1,80 or less irrespective of screen size the excise duty wa reduced from existing rate of 20% to 5% *ad valorem*; o TV sets having a unit value of Rs 1,801 and above excis duty rate of 20% *ad valorem* was retained. The impor duty on TV glass shell was reduced from 186% to 75%. A a result the price of 51 cm, single channel TV set cam down from Rs 2,350, a net reduction of 30%. Besides th total tax burden was reduced from 40% (prebudget) t 30% of consumer price (post-budget).

Almost all TV manufacturers put on the market T sets having a unit value of Rs 1,800. Though the prices o TV sets were substantially reduced, they were stil generally too high for middle-class consumers. In order t look into possibilities for further reduction in price of T sets and aspects related to quality control and facilities fo their servicing, the Electronic Commission set up a Pane on Cost and Price Structure Evaluation of Televisio Receiver Industry.

The Panel has recommended the restructuring of the industry on the following lines:

1. Of the units already licensed and in production, a limited number, say, not more than 6 may be carefully selected to serve as the focal point for technological development of the industry during the next 5 or 10 years.

2. The selected units may be permitted an increase in licensed capacity subject, however, to the condition that they will not themselves engage in manufacture of more than 10,000 or 20,000 sets per annum depending on the already established infrastructure. The licensed capacity of these units can be increased in step with the growth in demand and their ability to share in the growth.

3. These selected licencees would be required to subcontract assembly operation to the smaller units already approved by the Department of Electronics. The assembly operation will be on the basis of the technical parameters and design specification established by the licencee.

4. A standard form of contract between larger licencees and subcontracting assemblers should be evolved so as to ensure that there is no exploitation of the smaller units and also a clear demarcation of responsibilities and obligations between the larger licencee and the assembly unit.

5. Until such time as the existing assembly units are able to achieve at least their presently licensed capacity, the larger licencees should be required to limit their subcontracting activities to the existing approved units.

A restructuring of the TV receiver industry on these lines would, in the view of Panel, help to develop, on the one hand, a small number of production/marketing units with requisite technical financial and managerial resources and, on the other, avoid the danger of excessive concentration of production activity in an industry which is eminently sealed for decentralized assembly operation. In due course of time, the non mechanized and decentralized production of TV receivers may find an adequate export avenue and may provide mode for employment of technically skilled persons.

The TV receiver industry becoming a source of productive employment is not limited to the assembly alone. The Panel advocates special measures to be taken to encourage the development of TV servicing and maintenance facilities on a small scale basis. Besides, the growth of the TV receiver industry can also have a major impact on the growth of the components industries.

R & D

The electronic industry, except entertainment, is making test and measuring instruments, electro-medical equipment and process control instruments. The Central Electronics Engineering Research Institute, Pilani. has developed technical know-how in TV test instruments antenas, TV camera monitor, microphones and other items. The Electronic Systems Division of ISRO has developed a solid state TV. BEL has developed several types of transmitting tubes, high power valves for braodcasting and communication equipment. TV transmitters upto 100 KW and accessories have been developed indigenously. Development of items like control consoles, studio equipment, TV receivers, etc. are underway. A wide variety of special electron tubes have been developed. Various laboratories are engaged in the development of semiconductor devices. A variety of materials including ferrites and ceramics, have been developed.

Exports

Television receivers were not exported until 1973 when a TV set was exported to Bangladesh at a price of Rs 900. Even now the export of TV sets is negligibie, and limited only to some African countries like Kenya and Nigeria. The lack of export is partly due to the high cost of Indian TV sets and partly due to technological limitations. However, television components are being purchased even by advanced countries like UK, USA and Germany.

The exports of TV receiver parts and transmission parts are shown in Table 2.

TABLE 2 - EXPORT OF TV (QTY IN MILLION NOS; VAL. IN RS THOUSAND)

Year	Receiver parts		Transmission parts	
	Qty	Val.	Qty	Val.
1974-75	23.58	688.7	8.75	514.1
1975-76	1.21	720.2	9.83	461.4
1976-77	1.96	327.1	25.97	302.7

TABLE 3 - IMPORT OF TV (QTY IN MILLION NOS; VAL. IN RS THOUSAND)

Year	Receiver parts		Transmission parts	
	Qty	Val	Qty	Val
1974-75	203,790	16,514.9	57.17	7,625.2
1975-76	334,810	16,312.7	40.19	7,565.5
1976-77	711,733	20,094.9	119.39	36,161.7

Imports

Import of TV sets, except for medical or other special purposes is banned, Import figures for TV receiver parts and transmission parts are presented in Table 3 [*Electronics Information and Planning*,1978 5(4), 249; Annual Report, 1977-78, Department of Economics, 46. 51. 64, 76, 207; *Indian Electronics Directory*, 1976-77, 34; H.T., 14.3.78 and 22.9.77; E.T., 11.5.78; B.S., 17.5.78].

2. INDUSTRIAL NEWS

2.1 GENERAL

2.1.1 *Textile Policy*—The textile industry is the oldest and the single most important industry in India in terms of providing for one of the basic needs of the people. With the age, its performance has gone unsatisfactory and the incidence of sickness has grown to an alarming magnitude. The progress of modernising the outmoded equipment has been tardy.

The less organised and decentralised sectors of handloom, khadi and sericulture have been languishing with several problems like supply of yarn, marketing arrangements, competition from the powerlooms.

The absence of clearcut and unambiguous policies, definite time bound objectives relating to various facets of this diverse industry have been largely responsible for all this.

The Government has farmulated a new textile policy to help the industry out of this state and to provide conditions for its stable and steady growth in future. Announcing the discontinuation of the present pattern of imposing obligation to produce controlled cloth with effect from Oct.1, 1978, in its wake, the policy aims to achieve the following objectives in a broader sense: (i) production and availability of adequate supplies of cloth, of acceptable quality and at low prices, for the masses; (ii) improved arrangement for the distribution of this cloth to the weaker section of the population; (iii) rapid development of the decentralised sector including handlooms khadi and sericulture and maximisation of employment thereby; (iv) harmonious balance between the use of cotton and synthetic fibres, ensuring that incomes and employment of cotton growers is maximised and optimum use is made of the potential for the production of synthetic fibres from the high aromatic gas and naphtha, feedstock available in the country.

The Government consider it necessary that supply of cheap cloth for the weaker section and the rapid development of the handloom sector should be simultaneously accomplished. The manufacture of control cloth in the organized sector would be phased out over a period of time consistent with the growth of production of required varieties of cloth in the handloom sector. The present pattern of imposed obligation to produce controlled cloth w.e.f. October 1, 1978, is proposed to be discontinued. The financial burden now would be distributed equitably over the entire industry. This form of burden sharing would b used to subsidise the sale of cloth from the mill ar handloom sector initially and from the handloo sector eventually. The mill made controlled clo would be limited to 400 million square metres, ar would be produced both by the NTC and priva sector mills. After earmarking the NTC share production of controlled cloth, contracts for th production for the remaining quantity would b given to private mills on the basis of competitiv bids, and subject to the price not exceeding the co at which similar cloth would be manufactured b the NTC mills. NTC will be responsible fo meeting shortfall in the production by priva sector mills. A number of steps would be taken t enable the decentralised and handloom sectors t fulfil the role assigned to them in industrial an employment policies of the Government. Th measure are:

(i) No increase in weaving capacity would in futu be allowed in organised sector. The bulk additional textile requirements would be met fro the decentralised sector, increases in production the organised sector being limited to that arisir from the modernisation of out-dated equipmen Powerloom capacity would also not be allowed t increase. Legislation would be introduced t prevent the growth of powerlooms.

(ii) The existing unauthorised powerlooms woul be registered and regularised, on payment of deterrant penalty.

(iii) After the phasing out of the mill mad controlled cloth, subsidies would be allowed onl for handloom and khadi cloth.

(iv) Steps would be taken to bring into operatio adequate new spindlage, so as to meet the fu demand of the handloom sector for yarn. Th NTC would, in particular, give this aspect priorit attention, and increased availability of yarn fron the public sector would help to maintai reasonable prices. The handloom units would als be registered, and such registered units would b given preference in the supply of yarn.

(v) The policy of reserving certain items of cotto textile for the handloom sector would b effectively implemented. Subject to this, th government would encourage the powerloom i the decentralised sector to compete effectivel with mills.

In order to provide cotton to the textile industr at reasonable prices and also protect the interest of the farmers growing cotton, the governmer

intends that the production of cotton would be enhanced through improvements in yields by improving irrigation and other essential inputs. The cotton growers would be assured a reasonable minimum price. The Cotton Corporation of India would be required to maintain price within the prescribed range by making purchases, operating buffer stocks and exports. The use of synthetic fibres would at all time be without detriment to the interests of cotton growers.

The modernization programmes in the organised sector will be accelerated by providing loans.

Programmes would be undertaken to increase rapidly the domestic wool supply especially of the quality required for garments. The ban on the weaving capacity expansion in organised and powerlooms sector will not apply to the woollen sector, while expansion of machine made carpets would not in general, be allowed, such expansions would be permitted in export areas.

Necessary facilities and assistance would be provided for the promotion of sericulture in states which have a potential for this activity.

Research and development work would be strengthened to solve the problems facing the textile industry, and particularly those relating to. handloom and khadi (E.T., 8.8.78).

2.1.2 *Import Policy*—The definition of spares and components have been enlarged to include accessories and attachements, the limit of Rs. 1 lakh per item in the restricted list applicable to export houses, has been raised to Rs. 2 lakhs, and automatic licence facility has been enlarged as part of the several changes in the import policy for both actual users and registered exporters.

An addition to the extent of 10 per cent of the value of licences has been made to enable the industrial users to import consumable.

Items included in the restricted list which could not be imported as 'permissible' spares by the actual user in the earlier policy are now allowed to be imported.

Inflow of components and materials required for electronic industrial units has been made easy to give a boost to their indigenous production and also export. This is done by identifying specific components which are made indigenously and leaving the rest for import under general open licence.

As regards small tools and small precision measuring instruments, the industrial user have now been permitted to use their automatic licences to import within limits any of the tools and instruments included in the banned list. Similar facility has been extended to exporters of engineering goods against their replenishment licences.

Small industries requiring automatic licences for value less than 50,000 are granted such licences on a repeat basis. In such cases, there need be no subdivision of the total value among iron and steel items, non-iron and steel items and spares. They can now utilize their licences as best as they can for maintaining registered industrial activities.

Exporters of spares and components of machine tools, internal combustion engines, motor vehicles and automobile ancillaries and. railway equipments will be eligible to import replenishment at the same rate as that applicable to the respective parent product.

Import replenishment has been restored to certain export products w.e.f. 1.4.78 as had been denied in the earlier policy.

The list of export products qualifying for import replenishment will be open to additions and modification in course of the year, depending upon the progress in exports vis-a-vis industrial development.

Import of wood wastes and synthetic waste has been allowed for exporters of appropriate woollen products.

X-ray films and other photographic films not being made indigenously have been allowed for import by all persons under open general licence.

The crude drugs required to be imported for Unani and Ayurvedic purposes have been ennumerated to make their imports more convenient at the time of customs clearance. This has been rationalised. While doing this, the list of such industries has been reviewed and reduced as far as possible.

The list of items included in the appendix 26 to the policy is not available to export houses for the utilization of their additional licences. It has been reviewed and several deletions have been made and a few items added.

Import of gold for promoting jewellery export, manmade fibres and filament, second hand machinery are under review and decisions will be announced shortly (F.E., 29.7.78)

2.1.3 *STC to Export More Small Sector Items*—The State Trading Corporation has planned to export more products of small scale sector. This shift has been necessitated because of the Government's decision to decanalize a number of items and utilize STC to organize export of only those items which served a specific social purpose. This shift

will help the small sector in receiving the assistance from STC in the procurement of critical items of raw materials, in manufacturing quality and in obtaining the technical know-how and in marketing (F.E., 8.7.78).

2.2 ENGINEERING INDUSTRY

2.2.1 *High Energy Storage Battery*—The Central Research Laboratories of Matsushita Electric Industrial Company Ltd, Osaka, Japan, has developed a storage battery with drastically improved life and energy. In this battery, nickel is used as the positive plate and iron the negative plate. As a result, the energy density and life are 2 or 3 times that of conventional lead acid battery. The development of this battery will promote the realization of electric driven cars for practical use.

The storage battery is alkaline type and consists of sintered iron and nickel electrodes, which ensure large power when starting with slight voltage drop and high voltage discharging. These components are separated by a microporous resin separator. The energy density of the battery is 80 wh/kg, more than double the conventional nickel-cadmium battery with 30 wh/kg. This doubles the time of discharge and also lengthens the battery life, more than 1,000 recharges compared with the 300 to 500 times of the conventional nickel-cadmium battery [*Indian & Eastern Engr*, 1978, **120**(5), 224].

2.2.2 *First Continuous Casting Plant*—India's first continuous steel casting plant has been indigenously designed and developed by the Tata Iron & Steel Company. This vertical type 12 tonne caster, is fed by steel from electric furnaces and discharges 2.5 metre to 11 metre long alloy steel billets and slabs. The new plant established at Adityapur at a cost of Rs 2.5 crores should be valuable for future modernisations of steel industry in India [*Indian & Eastern Engr.*, 1978, **120**(5), 215].

2.2.3 *Silver Paste for Capacitors*—The National Chemical Laboratory (NCL), Pune, has developed a process for the manufacture of silver paste used in the production of mica capacitor electrodes.

The electrode material in the form of a paste facilitates the application of screen printing techniques which were being employed at present by capacitor manufacturers. The glass in the paste forms a matrix for conducting metal particles and this facilitates firm binding with mica substrate. These pastes are not manufactured in India at present and the entire demand is met through imports.

In the NCL process, silver is precipitated from a soluble salt of silver. The silver is intimately mixed with low softening glass and is processed with a highly viscose mass prepared from organic filler and solvents to give the paste.

A pilot plant with a capacity of one tonne per annum has been set up. The cost of production according to the new process comes to Rs 167 per kg whereas the present market price is Rs. 2000 per kg (Hindu, 31.7.78).

2.2.4 *Solar Power Packs From BHEL*—The Bharat Heavy Electricals Limited, has undertaken the development of small solar power packages to make power available to remote rural areas which may not get power through conventional means in the next 10 to 15 years. Development work on these energy packages is based on data collected from the 10 kw solar power plant at Madras set up jointly by BHEL, IIT, Madras and a West Germany firm.

A 20 kw vapour turbine to form part of the solar packages is also being developed by BHEL. This turbine can be used for pumping water for irrigations purposes also (Hindu, 31.7.78).

2.2.5 *Sun-powered Cold Storage Unit*—The mechanical engineering department of the Indian Institute of Technology, Powai, Bombay has developed a cold storage unit based on the solar energy with immense potential for widespread use in the rural areas. Though it started functioning in 1977 but will be on full stream by the end of 1978 or early 1979. It will serve as a small half tonne refrigerator with storing (for agricultural products) space 20 × 15 × 12 ft. According to DST, the principle of solar cold storage unit could also be used to air-condition buildings (B.S., 24.6.78).

2.2.6 *Prospects of exports to China*—The mission organized by the Association of Indian Engineering Industry (AIEI) has found good prospects for the export of three items, steel pipes and tubes, wire ropes and pre-stressed concrete wires to China. They have already purchased 6000 tonnes of pre-stressed concrete wires. Besides Chinese are also interested in the engineering items like oilfield and exploration drilling machinery, mining, packaging, transport and materials handling equipments (B.S., 2.7.78).

2.2.7 *Ideal Lead Dioxide Electrode*—The National Chemicals Laboratory for Industries, the Agency of Industrial Science and Technology in Japan has made an ideal lead dioxide electrode using titanium lath as a base.

It is made by first plating silver on titanium lath

which is electrodeposited with a newly discovered alpha lead dioxide and is then electrodeposited with beta lead dioxide in layer.

This Japanese developed electrode requires no precious metals such as platinum and is reported exceptionally free from the major defects of conventional lead dioxide elctrodes in electro oonductivity, manufacturing method, weight and cost. It is very effective as an anode in waste electrolytic treatment and metal smelting (*Chem. Times*, 10.7.78).

2.2.8 *Machine Tools Plant*—A Rs. 4-crore machine tools plant will shortly be set up in Kenya by the Hindustan Machine Tools (HMT) and the Industrial and Commercial Development Corporation of Kenya.

This project is the first venture in Kenya to be undertaken by the Government-owned institutions of the two countries.

It will produce basic machine tools for local metal and wood-work industries with 25% participation of HMT (F.E., 8.7.78).

2.2.9 *Sowing Machine*—A prototype of a tractor-mounted multi-crop fertilizer seed drill-cum-planter has been designed and developed by a Research Engineer of Punjab Agricultural University.

This machine gives a trouble-free service over an area of about 65 acre by actual sowing of different kharif crops like cotton, groundnut, maize, bhindi, soyabean and arhar both at research farms of the university and at farmer's fields in different villages of Ludhiana district (F.E., 25.7.78).

2.2.10 *Switchgear Unit*—Jyoti Ltd, Baroda, is going to set up a new switchgear and switchboard manufacturing plant and is also expanding production facilities for industrial ceramics. This plant will help in increasing the Company's turn over of switchgear and switchboards by 75% to 100% in the next three years. Even the present capacity of the ceramic products is expected to increase from 122 tonnes to 210 tonnes per year in order to meet the growing demand for sophisticated industrial ceramic products required by the electrical, petro-chemical and textile industries (B.S., 10.7.78).

2.2.11 *Precision Tools*—Two high precision instruments, type 442 thermo air and type 642 a-m vane anemometer, have been brought in the market by Schiltknecht, Zurich represented in India by Larsen and Toubro Ltd, for industries using anemometers for draught and air flow measurements which have wide application in air-conditioning and heating equipment, cooling and drying chambers evaporation and thermal exchange processes.

The type 442 thermo air consists of a small thermister heated by a battery. As the air flows past it, the thermister cools down according to the rate of flow of air, therby measuring the temperature. In conventional types of instruments, compensation for ambiant temperature drift, battery voltage etc. has to be made, but in Schiltknechts thermo air, automatic compensation of these factors is achieved through an additional precision sensor specially built into the probe.

Schiknecht's type 642 a-m vane anemometer is reported to be the world's smallest, with a head diameter of only 15 mm. The revolutions of the vanes are scanned electronically by the measuring head and converted into airflow rates. The measuring head can also house a thermister to give the temperature indication as well. The 642 a-m has several advantages over pressure tubes and thermo electric anemometers: it is completely independent of the changes in density, temperature and pressure of the medium; it gives instantaneous and direct measurement of velocity of flow and it is suitable for remote reading.

Further details can be obtained from: Larsen & Toubro Ltd, Instruments division, P.B. No. 278, L and T House, Ballard Estate, Bombay-400038 (B.S., 10.7.78).

2.2.12 *Twilight Switches*—Indian Engineering Co., Worli Naka, Bombay, has introduced photo-electric automatic light control also known as twilight switches.

These switches are useful for automatic control of street and workshop lighting, advertising signs, passage and staircase lighting, yard and bay lighting and also for flood lighting.

The switches are designed to switch the artificial lights on and off automatically, using the daylight intensity as reference. It consists of a control unit and a sensing unit. The sensing unit monitors daylight conditions and accordingly triggers its control unit and the relay contact changeover. The sensing unit is contained in a separate weather-proof housing. Relay/contactor of suitable capacity is supplied (E.T., 21.7.78).

2.2.13 *Solid State Flasher*—Indian Engineering Co., P.O. Box 16551, Bombay-400018, has introduced a solid state flasher blinker which can be used as a warning signal for variety of industrial applications for visual effects, traffic crossings mines and tower lights, etc. It consists of a lamp

unit and a control unit which adjusts the flash time. The output from the control unit enables the lamp unit to flash. It operates with solid state circuit which keeps the switching frequency stable through out (E.T., 21.7.78).

2.2.14 *Diesel Engine*—The Cooper Engineering Ltd has introduced the MVC-4(A) Diesel engine which can power medium/large passenger cars, jeep, etc. This engine is also an ideal replacement for PA-6 petrol engines used in the delivery vans and mini buses.

The Cooper engine develops 55 hp at 2,400 rpm and attains a maximum torque of 18.5 m/kg at 14,500 rpm. It is provided with low mounting position water pump, suitable clutch housing, flywheel and starting arrangement. These engines are 4-cylinder, high speed, vertical totally enclosed, and water cooled. They can be coupled directly to generators of 25 KVA output when running at synchronous speed at 1500 rpm.

These diesel engines can be used for various industrial applications such as centrifugal pumps, mixers, air compressors, and other applications as road rollers, stone crushers, concrete mixers, winches, forklifts and platform trucks.

For further information contact: Cooper Engineering Ltd, Marketing Division 658, *Jangli Maheraj Road, Deccan Gymkhana, Poona-411004* [B.S., 8.5.78; *Industr. Times*, 1978, **20**(10), 17].

2.2.15 *Electronic Lantern*—Summit Private Limited, Calcutta, has marketed a handy, portable electronic lantern with on/off switch in two models of 6-inch and 9-inch tube each. The two models are priced at Rs 257.60 and Rs. 295.02 respectively. Both the models ensure pleasant light from 6 months to one year. The only expense in these lanterns is replacement of tube costing Rs. 18 a piece and of the battery costing Rs, 60 a piece. In near future, the company will bring out a novel model of electronic table lamps in some prices as those of lanterns suited for students and officers (B.S., 4.6.78).

2.2.16 *Manual Mini-printer*—Manna Engineers, CIAB G.I.D.C. Vatva 382,445 Dist. Ahmedabad has introduced a postcard size manually operated tradle design mini-printer priced at Rs 2,000 ex-works. It is capable of printing like any other power driven large size printing machine. It is useful as an overprinting machine to imprint on lables and cartons expiry date, batch no., retail price etc. (E.T., 12.6.78).

2.2.17 *Inducting Motor*—Four engineering students from Rashtreeya Vidyalaya College of Engineering, Bangalore, has successfully designed and fabricated a three phase linear induction mot with manufacturing price at Rs 1500/- only. T motor works on the principle of the line magnetic field. In the high speed railway syster these motors can give a speed of over 500 km (E.T., 12.6.78).

2.2.18 *New Slub Catcher*—The Ahmedabad Texti Industry's Research Association (ATIRA) ar Kinarivala RJK Industries, Ahmedabad, ha jointly developed an electronic slub catche working on opto-electronic principle, for use textile mills. It can be fitted onto any no automatic winding machine and has specif advantages over the mechanical slub catcher. Th new device could give a clearance efficiency about 60 to 80 per cent, depending upon th setting adopted. This will help textile mills t remove objectionable yarn faults at any desire optimum level. Due to opto-electronic principl changes in climate would not hamper i performance. Its price is expected to be little mor than half of the imported electronic slub catche (E.T., 4.5.78).

2.2.19 *Infra-Red Detector*—The Central Electrochemica Research Institute (CECRI), Karaikudi, ha developed the know-how for the production c lead sulphide cells capable of detecting infra-re radiation in the region of 1-3 μm with a peak at 2. μm. These new detectors can be used to detect variety of defence and civilian purposes like fire a well as overheated hot axles in railway wagon intruding burglars, ammunition production unit weapon firing surveillance, military movement during nights etc. In geological applications, th Infra-Red Detectors can provide informatio about the near surface state of geologic materials, particularly density, water content an heat transfer (F.E., 3.6.78).

2.2.20 *Special Batteries*—Bharat Electronics Ltd (BEL at its Pune unit, now under construction, wi shortly start producing magnesium – manganes dioxide batteries. These batteries are similar in siz and shape to the standard Leclanche dry cel except the magnesium anode and electro chemistry to suit this anode. Magnesium batterie being five times more in energy-to-weight ratic about three times more in capacity for the sam weight with very high energy density, are superio to standard dry batteries. BEL is expected t produce batteries valued about Rs 4.5 crore a yea (E.T., 27.4.78).

2.2.21 *Hind. Teleprinter*—Hindustan Teleprinters Lt (HTL), a public sector undertaking, will short start manufacturing sophisticated electron

teleprinters. The company is planning to take up the manufacture of this equipment in stages over the next five years. The new equipment, being highly varsatile in operation, can be used for any language script and also as a data terminal for computer systems (E.T., 11.5.78).

.2.22 *Silicon Steel Project*—The Silicon Steel Project designed to manufacture 37,500 tonnes of cold-rolled grain-oriented and 36,000 tonnes of cold-rolled non-grained-oriented steel sheets at Rourkela steel plant will go into production in January 1981. At present, it is the only manufacturing facility available in India. The products which are used for the manufacture of various types of motors and generators, will meet the entire requirement of the country (B.S., 19.4.78).

.2.23 *Titanium Alloy Equipment*—Titanium Equipment and Anode Manufacturing Company Ltd, Madras is going to manufacture fabricated titanium alloy equipment using a highly sophisticated welding technique, for the first time in the country.

The company has also received a licence from the NRDC for know-how for the manufacture of titanium permanent metal anodes which will replace consumable graphite anodes in the electrolytic industry.

These equipment which are utilized for space crafts like Aryabhatta and Rohini were being imported. Now these equipment will help in saving millions of units of power and also reduce the cost of manufacture of caustic soda.

The company has also planned to manufacture different types of titanium equipment for varied applications like pressure vessels, thermal condensers used in power generation and in the pulp, paper and fertilizer industry (E.T., 10.7.78).

2.3 CHEMICALS INDUSTRY

2.3.1 *Chemicals from Coal*—The Central Fuel Research Institute (CFRI), Dhanbad, has developed a new technique for retrieving acetylene and hydrogen cyanide from coal. This technique is the plasma technique, the equipment for which is fabricated in collaboration with Bhabha Atomic Research Centre, Trombay.

In the plasma technique, the reaction is carried out in a highly ionized gaseous system which is conducting but neutral by itself. A jet plasma is produced by striking a magnetically rotating arc between two electrodes. When treated at such a high temperature, coal yields gases containing acetylene and traces of methane, ethane, and hydrogen cyanide. The reaction is conducted in an inert atmosphere and the power input is of the order of 6-10 kw. High volatile non-coking coal is a good raw material for the production of acetylene and hydrogen cyanide [*Chem. Age India*, 1978, **29**(5), 374].

2.3.2 *Dry Printing Process*—A new method of transfer printing complex multicoloured designs by an all-dry process called fabprint process has been developed in UK. All types of fabrics can be used for printing by this process. This process is called film release transfer printing.

In this process, a transfer paper is coated with various inks based on different dyestuffs that are accepted by cotton. The transfer paper is placed upside down on the fabric to be printed and is passed through a heated nip roller. Within a few minutes the fabric comes out of the rollers with the print. The paper is easjly peeled away and the fabric is transfered to a oven heated to 200°C. The film degrades and disappears into the fabric with the dyestuffs firmly fixed to the fibres.

The advantage of this Fabprint process is that it does not require afterwashing and drying [*Man-made Textiles*, 1978, **21**(6), 293].

2.3.3 *Mobile Analytical Laboratory*—Rashtriya Chemicals and Fertilizers are introducing a mobile monitoring unit for the first time in the country. The unit will have analysers for sulphur dioxide, oxides of nitrogen and dust. There will be instruments to monitor wind direction, wind velocity and humidity and temperatures. These instruments will continuously record the data and operate for 72 hours automatically.

The mobile unit will be provided with independent power driven prime mover which will haul the unit to any location for measuring the ambient air conditions. The value of the unit will be about Rs six lakhs. In addition to analysers, the system will contain audio-visual alarms and strip chart recorders.

The above unit will be a boon to small units working in regions away from towns with analytical laboratory facilities [*Chem. Industry News*, 1978, **23**(1), 74].

2.3.4 *New Process for 1-Menthol*—A novel process for preparing pure, crystalling 1-menthol from Δ^3-carene has been developed at the National Chemical Laboratory (NCL), Poona. Δ^3-carene is a constituent of the inexpensive and readily available turpentine oil in the country. 1-Menthol is widely used in pharmaceuticals, cosmetics and perfumery industries.

At present, with a total installed capacity of about 3 lakh kg a year, the production of menthol is about 2.30 lakh kg. The consumption is around at 3.50 lakh kg.

Camphor and Allied Products (CAP), proposes to set up a 2 lakh kg/year menthol thymol plant. The menthol plant along with the resin plant is proposed to be set up at a total cost of Rs 4 crore. The commercial production of letter is expected after 1½ years from the comencement of construction work. CAP also proposes to export 25 per cent of its production enabling the country to earn foreign exchange around Rs 35 lakh a year (E.T., 1.5.78).

2.3.5 *Camphor Expansion*—A new unit, Pine Chemicals, based on indigenous technology and to manufacture turnpentine rosin and its derivatives, has been embarked upon by Camphor and Allied Products (CAP) jointly with the Jammu and Kashmir Government. The new project, estimated to cost Rs 3 crore, is expected to be commissioned in the third quarter of 1979. Its annual production is estimated at Rs 5 crore. During the first four months of the current year, the company's production and sale were 374 tonnes and Rs 2.10 crores respectively as against 337 and Rs 1.83 crores respectively in the corresponding period last year (E.T., 11.5.78)

2.3.6 *Anthranilates from Isatoic Anhydride*—Methyl and ethyl anthranilates are important perfumery chemicals occurring in several flowers and leaves. Methyl anthranilate is produced in India by some small manufactures but the ethyl anthranilate is not known to be manufactured.

The Regional Research Labsratory, Bhubaneswar has developed a single step process which can produce alkyl anthranilate of very high purity conforming to standard specifications starting from isatoic anhydride. The methyl ester is obtained in 80-85% yield whereas the ethyl anthranilate yield is 70-75%.

The capital required for a unit producing 3.75 tonnes of methyl and 0.7 tonne of ethyl ester per annum is 1.85 lakhs. The net profit over this investment can be 21%.

The process is released for commercial exploitation through the National Research Development Corporation of India [*Sci. Rep.* 1978, **15**(8), 564].

2.3.7 *A New Pyrethroid Insecticide*—Shell Chemicals, UK is introducing in the UK the first commercial product emerging from its groups of synthetic pyrethroid compounds called Outflank. The acceptability studies for control of nuisance flies in farm and other buildings have shown that it insecticidal activity is two times more than th existing compounds in the market. The produc offers complete fly control at very low dosage rate for upto 8 weeks.

The product is being introduced at a time whe resistance problem is building up with the organ phosphorus insecticides commonly used at presen in this type of application.

The product is to be marketed by She Chemicals as a 5% emulsifiable concentrat [*Pesticides*, 1978, **12**(6), 45].

2.3.8 *Titanium Substrate Insoluble Anodes*— Commercial production of titanium substrat insoluble anodes (TSIA), based on the know-hov developed at the Central Electrochemica Research Institute, Karaikudi, has been started b the Titanium Equipment & Anode Manufacturin Co. Ltd (TEAM), Madras. The firm i manufacturing electrodes with an apparen surface area of 3-m^2 per day.

Four leading chlor-alkali manufacturers hav switched over to the installation of TSIA (supplie by TEAM) in their chlor-alkali cells and the TSI installed cells are reported to be runnin satisfactorily.

TSIA were developed as an economic substitut for graphite anodes in the chlor-alkali cells. saving of the order of Rs 26 million per annum i expected to be realized by the chlor-alkal industry.

2.3.9 *Electrothermal Process for Calcium Silicide*—Th Central Electrochemical Research Institute Karaikudi, has developed an electrotherma process for the production of calcium silicide (C content 30%). A plant with a capacity of 27-30 k of calcium silicide per batch (3-3½ hrs) using 38 kva arc furnace has been installed at the Institute

Calcium silicide finds major use as a deoxidisin and desulphurizing agent in the iron and ste industry and as an inoculant in foundry casting. finds applications in defence oriented industries

The present annual demand for calcium silicid is about 100-150 tonnes and this is being met b imports.

Calcium oxide, ferrosilicon and suitable fluxin agents are the raw materials required for th process and these are available indigenously.

The total investment to set up a plant capable o producing 100 tonnes/annum of calcium silicide estimated at Rs 12.4 lakh. The cost of productio is Rs 16/kg, and the return on investment 32%.

MISCELLANEOUS INDUSTRIES

.1 *Garment From Pineapple Fibre*—The cottage and small-scale industries Department of the West Bengal Government has developed the pineapple fibre for making furnishing material and garments.

The fibre is stronger than cotton or jute. The yarn developed is soft and can be used for making shirts and coats. The twisted yarn obtained from pineapple fibre can be used for manufacturing furnishing materials.

Experiments are being made to better the quality of fibre by chemical treatment. The Ganges Rope Co. Ltd has estimated that about 2 tonnes of pineapple fibre is needed to manufacture textiles on a commercial scale (B.S., 23.6.78).

4.2 *Ophthalmic Glass - Blank Units*—The Union Government has decided to allow the establishment of a few more units only in the medium sector for the manufacture of ophthalmic glass rough blanks based on the latest technology. It has been done in order to meet the growing internal demand (E.T., 27.7.78).

.4.3 *Circular Knitting Machine—A* versatile knitting machine, with provision to interchange the interlock operations to rib knitting has been developed in UK. This machine has got a wide range as the cylinders and dials could be interchanged without any dismentling of equipment. There is also an interchangeable cam for both the cylinder and dial camboxes. These cams give versatility of fabrics within the range of two tracks on the cylinder and two bracks on the dial. Tuck, miss and knit interchangeable cam units are available on all four tracks.

An a.c. control unit provides slow, smooth start characteristic for the 4 kw (5.5 hp) main motor, which is operated by four sets of stop and start buttons positioned round the machine. The $\frac{1}{4}$ ($\frac{1}{3}$ hp) crawl motor, giving a speed of one revolution every three minutes, is controlled by a ring on the machine headbase.

The SB high-speed, 72 feed, 760 mm machines are offered in gauge 14 to 40. Their frames are of the tripod type, with all large rotating members carried on large-diameter precision bearings. Stitch length is controlled by a micrometer snail cam adjuster. Auto rib/interlock gating, pre-set at the factory, is provided for quick changing. There are provisions for extra long fabric take-down rollers to accommodate fabrics upto 1.1 m wide with a maximum roll size of 5.1 m diameter [*Engng News*,1978, 4(12), 27].

2.4.4 *Fumigant*—The Central Leather Research Institute (CLRI), Madras, has developed a fumigant, available in a tablet form to protect leathers and the articles of leather from fungi. This can be conveniently displayed in the show cases. Though CLRI has also developed an antifungal paper, but its use is only limited for packing leathers and their products.

The significant features of the tablet are: it is first of its kind and is easy to handle; has a pleasant smell; is a powerful insect repellent and can be moulded in any form and can be packed in a cellophane paper with a low volatility (F.E., 17.7.78).

2.4.5 *High Alumina Refractories*—High alumina bricks with aluminium content higher than 70% are made mostly from readily available fused alumina/bauxite. The Central Glass & Ceramic Research Institute, Calcutta has developed a method for making bricks with alumina content ranging from 70 to 95% from indigenous raw materials like bauxite, diaspore, technical alumina and other materials with the addition of minor amount of non-refractory materials as sintering aids. The bricks are formed from the graded sintered product at a pressure around 0.8 to 1.0 ton/cm^2 and firing at a temperature of the order of 1600°C in intermittant/tunnel kilns. The process is released through National Research Development Corporation of India for commercial exploitation (Hindu, 17.7.78).

3. ANNOUNCEMENT

3.1 AWARDS

3.1.1 *Top EEPC award*—The highest award of the Engineering Exports Promotion Council for the outstanding export performance for the year 1976-77, has been won by Tata Exports. This is a Rotating Shield for Best All India Export Performance. Out of the turnover of Rs 97 crores during 1976-77, the company exported engineering products worth Rs 61 crores [*Indian & Eastern Engr.*, 1978, **120**(5), 217].

3.2 PUBLICATIONS RECOMMENDED

3.2.1 *Mill Statement*—Compiled and published by the Millowner's Association, Elphinston Building, 10, Veer Nariman Road, Fort, Bombay-400001; Pp 67; Price Rs 20.

This publication provides the data on the growth of the cotton textile industry in India since 1919.

The mill statement gives the names and addresses of all the spinning and composite mills in India, names of their chairmen, managing directors or directors or owners, postal and telegraphic addresses of the registered offices of the mill companies, paid-up capital, the number of spindles - ring doubling and waste spindles - and looms - ordinary and automatic, the average number of spindles and looms working, the average number of workers employed daily (all shifts), the number of days worked, consumption of cotton, etc. The statement also contains the names and addresses and other details relating to waste spinning plants in the country (F.E., 30.7.78).

3.2.2 *Working Capital Management*, 1978, V.E. Ramamoorthy; Institute for Financial Management and Research, Madras; Pp 348, price Rs 50.

This publication gives in detail all important aspects of working capital management as a part of overall corporate management in the context of Indian conditions. This book will be useful for students, professionals and corporate executives.

3.3 EXHIBITIONS & FAIRS

3.3.1 *Indian Engineering Exhibition 1979*, organized by the Engineering Export Promotion Council will be held in Jakarata, Indonesia, from March 1-9, 1979.

There will be a product-wise display of capital equipment, electrical equipment, machine tools, transport equipment, textile machinery, light engineering, electronic and engineering contracting.

There will also be a separate section for Indi joint ventures in S.E. Asia. The Council has al planned to organize visits of about 150-2 important buyers and company executives fro this region.

3.3.2 *S.E. Asia 2nd Biennial International Electrical a Electronic Engineering Exhibition* will be held fro November 6-10, 1978 at Hyalt Convention Cent Singapore.

The exhibition will cover mainly a wi spectrum of technical, industrial and domest electrical and electronic equipment.

Over 350 exhibitors from 18 countries w participate in this show. Prominent industrialis from the participating countries are also expect to attend ENEX-ASIA 78 to present technic papers on the latest innovations in these tw industries.

3.3.3 *An International Furniture and Furnishi Exhibition* would be held at World Trade Centre Singapore from 7-11 April 1979. Th international event, where many countries woul be participating, is aimed at to provide a opportunity for preparing grounds for export furniture and furnishings.

Those interested may contact: Homemaker's 7 Scope International Pvt. Ltd., Suits 504, E Cheong Tower, North Bridge Road, Singapore-

3.3.4 *National Small Industries Fair 1978*, the first fair its kind in India, will be held at Pragati Maida Exhibition Grounds, New Delhi, from Novemb 14 to December 13, 1978. The main participan would be various State Governments, small-scal handicrafts, handloom and rural-based industrie trade associations commodity boards, a number manufacturing/trading units at their individu level and the Royal Government of Bhutan at o own invitation. The main objective of the fair is project the image of cottage and small industri with special emphasis on handloom, handicraf and khadi and village industries.

Interested participants can contact: A. Banerjee, Managing Director, Trade F Authority of India, Administrative Block, Prag Maidan, Lal Bhadur Shastri Marg, New Del 110001.

3.3.5 *An Indian Trade Show*, a show called Buyer-Sell Meet, will be organised by the Trade Developme Authority on the Cologne Fair Grounds October 1978. The show aims to strengthen a diversify commercial contacts in West German Belgium, Netherlands, Austria and Switzerlan for the products of export interest to Indi

manufacturers.

For further details contact: A.C. Banerjee, Managing Director, Trade Fair Authority of India, Administrative Block, Pragati Maidan, Lal Bahadur Shastri Marg, New Delhi-110001.

3.6 *Computer Festival* organized by the Institution of Engineers (India), Calcutta, will be held in October-November, 1978. This festival will be useful for a common man as well as for scientists, engineers and technologists.

The various programmes of the festival are:

(1) Apex seminar on computer applications and exhibition on computers to be held at New Delhi during Nov.10-12, 1978.

(2) *Training Courses on Computers*

(a) Basic introduction to programming and numerical methods to be held simultaneiusly at Kanpur, Madras, Ahmedabad, Chandigarh and Bhopal. The course comprises (i) lectures for seven days, and (ii) case studies for 2 days.

(b) Advanced course on numerical methods/computer techniques to be held at Calcutta during October 23-29, 1978.

(c) Computer appreciation courses for senior executives to be held at Hyderabad, Calcutta and Bombay during October 3-4, 1978.

(d) Computer appreciation courses for labour leaders, personnel managers and trade union leaders to be held at Calcutta and Bombay for two days.

(3) Panel discussion on the themes: (a) computers in planning, (b) computers in engineering, (c) computers in education.

(4) Engineer's Day - The Institution will celebrate September 15, 1978 at Engineer's Day which will form a part of the computer festival. It will compromise seminars, symposia, discussions at all state/local/sub-centres of the Institution throughout the country on the theme "Computer as a tool for Technologist Development".

Further information can be obtained from: R.K. Abrol, Organizing Secretary, Computer Festival, The Institution of Engineers (India), 8 Gokhale Road, Calcutta-700020.

Vol. 1 No. 10 Oct. 1978

INDUSTRIAL NEWS DIGEST

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PUBLICATIONS & INFORMATION DIRECTORATE, CSIR
Hillside Road, New Delhi-110012

INDUSTRIAL NEWS DIGEST

Vol. I No. 10 October 1978

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Industrial News Digest is a monthly bulletin issued by the Publications & information Directorate. A part of the Industrial Information Service of the Directorate, the *Digest* aims at providing packaged, down-to-earth technological and techno-economic information to industrialists, prospective entrepreneurs, and experts in both government and private agencies dealing with the management and planning of industry. Queries on technical and techno-economic matters are welcome.

Publications & Information Directorate, CSIR, Hillside Road, New Delhi 110012

ABBREVIATIONS USED

B. S.	—	Business Standard
E. T.	—	Economic Times
F. E.	—	Financial Express

Standard abbreviations are used in the case of all scientific and industrial periodicals.

1. INDUSTRY PROFILE

Chemical Industry (1)

Occupying a pre-eminent position in the national economy, the chemical industry ranks fourth (after iron and steel, engineering, and textile) amongst the major industries of India. It covers a wide range of industries, some of giant proportions, such as fertilizer and petrochemical complexes, and some of medium and small size, such as paints, and pharmaceuticals.

The growth of the chemical industry in India is of recent origin as compared to other industries like metallurgical, mining, mechanical or electrical. It started in the second half of 19th century and the progress till the beginning of this century was comparatively limited. The really significant growth of the industry has been after World War II and more specifically after Independence.

A beginning was made with the manufacture of basic inorganic chemicals like sulphuric acid, soda ash and caustic soda. Afterwards, the manufacture of organic chemicals, dyestuffs, drugs and pharmaceuticals were undertaken. Most of these items were manufactured from penultimate intermediates which were imported. However, with the growth of the industry and constraints of foreign exchange, attempts were made to manufacture most of the raw materials from indigenous sources.

Many important chemicals were not being produced in India at the time of Independence. Some important examples are : phosphoric acid, plastics, synthetic detergents, benzene, synthetic fibres, petrochemicals, pesticides, rubber chemicals, fine chemicals, and a host of others. Some like antibiotics, were not even discovered.

With the establishment of steel plants in the public sector, some cyclic compounds like benzene, toluene and naphthalene became available as byproducts of coke oven batteries. Next came the setting up of oil refineries in both the public and private sectors. In the absence of petrochemical complexes, naphtha (a byproduct of oil refining) became surplus and was exported.

Organic chemicals industry in India started later than inorganic chemicals, which was flourishing in the forties and fifties. The former started in late fifties or early sixties. But, even then it had not taken off to the extent other industries had. Until 1954, production of organic chemicals in India was based on fermentation alcohol. Ethyl alcohol, a byproduct of the sugar industry, was the starting material and even now a large volume of organic chemicals, plastics and synthetic rubber are based on ethyl alcohol.

India entered the petrochemicals field in 1966 when the Union Carbide's naphtha cracker at Trombay was commissioned. Then came National Organic Chemicals Industries Ltd (NOCIL) in 1968 to be subsequently followed by Polyolefins Industries, Herdillia Chemicals and Indian Petroleum Chemicals Ltd (IPCL). In fact, it was with the development of the petrochemicals industry that the Indian chemical industry received its strongest fillip.

The chemical industry, in the last 25 years, has attracted some of the best investors and industrial groups in the country. The investment in the industry grew from a meagre sum in the forties to Rs 300 crores in 1961 and to Rs 2,200 crores in 1970, when it constituted one-third of the total investment in the organized sector. During the above period the growth of the industry has been phenomenal. An important index of growth is the volume of production of basic chemicals. The following table which gives the production figures (in thousand tonnes) of a few chemicals in 1950 and 1975 will illustrate this. The limited number of items is due to the fact that very few chemicals were being manufactured in 1950.

	1950	1975
Sulphuric acid	108	1,488
Caustic soda	16	435
Soda ash	17	542
Ammonia	11	1,508
Nitric acid	—	456

Present Status

Basic chemicals and chemical-based products occupy a pre-eminent position in the national economy. Their production is not only capital and technology intensive but has also a high employment potential. They find extensive use in day-to-day life and have vital connections with the other segments of the total industrial spectrum.

The Indian chemical industry has the distinction of occupying the 10th position in the world production of chemicals. With a total of more than 700 units, the combined investment in the industry is placed around Rs 3,000 crores as compared to Rs 304 crores in 1961 and Rs 877 crores in 1966. The number of persons employed by the industry is estimated at about 16 lakhs, the gross value of production at Rs 3,000 crores, and the contribution to GNP (at 60% of gross turnover) at about Rs 1,350 crores.

The growth rate of the industry, as elsewhere in the world, has been one of the highest in recent years, the overall growth rate being of the order of 17 to 18 per cent per annum. However, accurate statistics about the industry are not easy to come by due to lack of adequate data on the small scale sector, which is quite prominent in certain areas.

The industry has done fairly well during 1975-76 and has, in fact, recovered from the setback it received in 1974. The production, specially of certain basic chemicals, increased considerably in 1976-77 and the higher production helped the industry to push up the exports. Production figures for a few important chemicals for 1974, 1975 and 1976 are given in **Table 1**.

TABLE 1—PRODUCTION OF CHEMICALS AND CHEMICAL PRODUCTS

(In thousand tonnes)

	1974	1975	1976
Fertilizers*	n. a.	1,870	2,222
Sulphuric acid	1,433	1,333	1,693
Caustic soda	431.6	443	504
Bleaching powder †	n. a.	25.29	24.37
Man-made fibres	n. a.	81.26	103
Dyestuffs, drugs and pharmaceuticals	n. a.	5.45	7.58
Penicillin (MMU)	254	252	246
Aspirin	0.8	1.03	1.12
Streptomycin	0.19	0.19	0.21
Vitamin C	0.22	0.34	0.48

*Total of nitrogenous and phosphatic fertilizers.
†Stable variety only.

Note — The 1977 production figures (in thousand tonnes) for caustic soda, man-made fibres and dyestuffs are 567, 138.76 and 17.31 respectively.

During the current year the industry's record should prove as satisfactory as during 1976-77 except perhaps for alkali industries like caustic soda and soda ash which are not able to utilize their full capacity. But, on the whole, the picture is quite promising. There is, of course, the problem of power cuts in some of the States. But the more disturbing worry is the labour unrest in Maharashtra which occupies a pre-eminent position in the chemical industry of the country.

Basic Inorganic and Organic Chemicals

Among the inorganic chemicals which have considerable industrial use are sulphuric acid, hydrochloric acid, nitric acid, caustic soda and soda ash. Manufacture of sulphuric acid is very largely dependent on imports of sulphur, because sources of elemental sulphur are virtually non-existent in India at the moment. However, efforts are now being made to produce sulphuric acid from pyrites mined at Amjore in Bihar and from sulphurous gases from zinc smelters at Alwaye and Udaipur, and copper smelters at Ghatshila and Khetri. The production of sulphuric acid in 1976 was 16.93 lakh tonnes. The present target is 27 lakh tonnes by 1980.

The average production of nitric acid is placed at about 3.72 lakh tonnes during the last few years. While the Fertilizer Corporation is the principal and the largest producer of nitric acid, additional capacity is being created both in the public and private sectors by which production of nitric acid would go up to 6 lakh tonnes/yr in the immediate future.

Alkali chemicals have been given adequate importance in the country's chemical production programmes. The production of caustic soda in 1976 was 5 lakh tonnes. However, present production has almost touched the targeted production of 6.1 lakh tonnes by 1980. It is expected to go up to 9 lakh tonnes by 1979 and to 16 by 1983-84.

One unit in Kerala has been expanded to produce 100 tonnes of caustic soda/day and a new unit has already been set up in Karnataka with a capacity of 100 tonnes/day. The Gujarat Alkalis and Chemicals are also setting up a plant of 115 tonnes/day. With these increases in capacities, production of caustic soda should very well touch the 10 lakh tonnes mark pretty soon. The recent spurt in the market prices of soda ash has raised a lot of controversy. This has been attributed to the temporary shortages, as the installed capacity (6.32 lakh tonnes) is sufficient to meet the indigenous demand.

Chlorine utilization, which is of significant importance in the growth of the caustic soda industry (being its byproduct), has improved substantially and it is anticipated that the demand will increase rapidly with the full development of the petrochemical industry as has happened in developed countries. Chlorine production, currently at 3.8 lakh tonnes/yr, is keeping pace with the production of caustic soda.

Being another byproduct of caustic soda, availability of hydrochloric acid is quite plentiful at 1.5 lakh tonnes/yr. The quantity available is more than sufficient to meet the domestic demand. The possibilities of exporting hydrochloric acid to south-east and west Asian countries are being explored at the moment. Consequent to the increase in the production of caustic soda, production of hydrochloric acid is expected to go up to 2.5 lakh tonnes by 1980. This would certainly leave enough for widening the export market.

Potash alkalis were not produced in the country until 1967, but today the industry has a total installed capacity of 12,375 tonnes with the production amounting to about 50% of the capacity last year.

Production of calcium carbide and industrial gases have been started in India since 1960. The country with its vast indigenous resources is now able to meet most of its requirements of salts/compounds of sodium, barium, calcium and manganese. Even the laboratory chemicals sector has progressed considerably and the quality chemicals required for research and analytical purposes are available from local manufacture.

Accounting for a total investment of Rs 800 crores, the 20 fertilizer plants in India produce about 22.22 lakh tonnes of fertilizer/yr. This quantity, however, is not adequate to meet the domestic demand. The situation will change when the coal-based units at Ramagundam and Talcher start full-scale operations.

As regards organic chemicals industry, Union Carbide, NOCIL, and Herdillia Chemicals in the private sector, and IPCL at Koyali and the refinery-cum-petrochemical complexes at Brauni and Bongaigaon in the public sector constitute the major units which manufacture some 14 organic chemicals.

Petrochemicals—After 1965, the growth of petrochemical industry started and major petrochemical plants manufacturing plastics, raw materials for synthetic fibres and a host of organic chemicals, were put up in and around Bombay. As stated earlier, there are two naphtha-crackers in the private sector besides IPCL in the public sector. The aromatics project of IPCL at Baroda has an annual capacity for producing orthoxylene (21,000 tonnes), dimethyl terephthalate (24,000 tonnes), and mixed xylene (25,000 tonnes). The olefin projects will produce 1.25 lakh tonnes of ethylene which will be used for producing other petrochemical derivatives. Foundations for a petrochemical complex (cap. 10,000 tonnes/yr orthoxylene) and a polyester unit (cap. 30,000 tonnes/yr) have been recently laid in Assam. The availability of large quantities of crude and gas from Bombay High and Bassein in the years to come is bound to aid further development of the industry.

The anticipated production of petrochemicals will lead to a rapid progress of the organic chemical industry and reduce our dependence on a variety of imported organic chemical raw materials and intermediates.

Pesticides—Along with other chemicals the pesticides industry has also registered a phenomenal growth. There are about 39 units producing the basic insecticides, fungicides, rodenticides, nomatocides and another 35 manufacturing formulations. The current total licensed capacity is more than 70,000 tonnes. However, the production which was about 51,523 tonnes in 1972 came down to about 39,000 tonnes in 1977.

The industrial items produced include nicotine salts, D.D.T. preparations, BHC dust, parathion, malathion, copper oxychloride, zinc phosphide, etc. Production of some of the pesticides are sufficient not only to meet the internal demand but also surplus is available for exports.

Dyes, Intermediates, Alcohol and Coal Tar Chemicals

Indian dyestuffs industry has made considerable progress, although a beginning was made only as late as in 1952. Present production of dyestuffs covers a range of 600 types in the important groups like azo dyes, basic dyes, disperse dyes, chrome, naphthol, fast colour bases, optical whitening agents, organic pigment colour, reactive dyes, sulphur dyes, vat dyes, pigment printing emulsions, fluorescent brightening agents, etc.

The pace of development in the dyestuffs manufacturing sector has been so spectacular and pronounced that there is self-sufficiency both in finished products and intermediates, of which there are some 85 items.

The total installed capacity of dyes inclusive of the small scale, is currently estimated at 21,961 tonnes, the same being accounted for by 21 units in the large scale sector and 129 units in the small scale sector. The total annual turn over of dyes is 17,500 tonnes. This production is not only sufficient to meet the entire domestic demand, but there is also a surplus for the export market even in the developed countries.

One of the special features of this industry is that a number of units in the small and large scale sectors have been established without any foreign collaboration. Some of the units have set up quite adequate research facilities and have not only started manufacturing the latest types of dyes based on their own research results but are engaged in developing other dyes for different synthetic fibres.

A total of 30 crore litres of industrial alcohol is produced by some 120 distilleries in the country. Besides this, petrochemical complexes are also equipped to produce a total of 60,000 tonnes of plasticizer alcohol. To overcome the energy crisis and at the same time make the best of available materials, the government has now decided to encourage the growth of alcohol-based industries.

With the adoption of the policy of prohibition in one form or another and increased production of sugar, the production of industrial alcohol is bound to

go up further. A recent estimate is that India can produce industrial alcohol to the extent of 25 lakh tonnes equivalent of diesel/yr.

Drugs, Pharmaceuticals and Fine Chemicals

Using a total investment of well over Rs 200 crores, some 118 large scale units and about 2,422 small scale units produce drugs and pharmaceuticals worth Rs 300 crores/yr The large scale units include the 2 units set up in the public sector at Rishikesh and Hyderabad with Russian collaboration.

Though soaps, toilet and cosmetic articles and detergents are not chemicals in the strict sense of the term, they do come under the chemical industry. The current production of soaps is estimated to be about 2.8 lakh tonnes against an installed capacity of 3.18 lakh tonnes spread among 45 units. Plans are afoot to step up the production of soaps to 34 lakh tonnes/yr. As a byproduct, the soap industry also produces, some 7,000 tonnes of glycerine/yr. Present production of synthetic detergents is more than 1 lakh tonne (installed capacity 2 lakh tonnes for 16 units).

The domestic market for soaps, detergents and beauty aids is estimated to be worth about Rs 151.7 crores.

Besides major production units like Hindustan Lever, Calcutta Chemicals, Godrej, Tata Oil Mills, Colgate-Palmolive, Mysore Government Soap Factory, Kerala Government Soap Factory and a number of others, there are some 7,000 small units scattered all over India who manufacture one item or other in the toiletry and cosmetic range. The value of tooth pastes, talcum powders, and creams, shaving soaps and creams, and shampoos, etc. is placed at Rs 56 7 crores/yr.

Small Scale Sector

Though simple items like ink, soap, etc. were being manufactured in the country from time immemorial, paint industry is perhaps the first one to be taken up in a big way by the small scale sector after the inception of the office of the Development Commissioner for Small Scale Industries in 1956.

Manufacture of paints for home consumption in the small sector was closely followed by non-power soap industry, which now comprises as many as 2,000 units spread all over the country. They are mainly catering laundary soap in villages and non-urban areas. The dyestuffs industry also came into being around this time. There are at present about 120 units in the small scale sector. Then came into existence a large group of small scale units manufacturing plastics products like toys and domestic implements. But they were all dependent on the large primary producers for polyethylene, polystyrene and PVC. By 1970; with the availability of almost all the primary organic chemicals like benzene, toluene, methanol, butyl alcohol and several solvents, the manufacture of organic intermediates in the country was started in both small and large sectors. The government also insisted on the large dyestuff companies to take up the manufacture of intermediates. Similarly, there has been a good growth of pharmaceutical formulations in the country with as many as 2,000 small scale formulations as against about 100 large scale ones. These were also asked to produce basic drugs, which are all of high technology items. The assistance given by the Government of India by inducing the nationalized banks to give financial aid to the small scale units, had been quite helpful in the setting up of the small scale chemical industry.

The industrial growth in the small scale chemical industry is firmly established and the growth potential is vast. It has expanded its horizons from simple items like inks, washing soap and paints to highly sophisticated items which were previously the monopoly of large scale units only. It is encouraging that the small scale sector has been able to stand in competition with the large scale sector. In view of the rap.d progress and good performance of the small scale units, further capacity for manufacture of quite a few items is now reserved for this sector. Small scale entrepreneurs have developed such items as fluorescent pigments, synthetic pearl essences, synthetic rubber oil seals, laboratory and diagnostic reagents, etc. What is more, some foreign manufacturers have come forward to seek collaboration with some of the small scale units in the hope that they can produce in their own countries some of the items developed by Indian small scale units.

Machinery and Equipment

There is enough expertise in the country to fabricate all the plant and machinery required for setting up various chemical plants. Also, some small entrepreneurs have evolved their own plants and equipment for the manufacture of certain items for which even large scale units in India have been seeking foreign collaboration.

1. INDUSTRIAL NEWS

2.1 GENERAL

2.1.1 *Import Under Technical Development Fund Scheme*—The Ministry of Industry has announced a further liberalization of the grounds on which industrial entrepreneurs can utilize free foreign exchange resources available to them under the technical development fund scheme for the import of machinery and know-how.

The scheme which was originally introduced in March 1976, will now make it possible for the entrepreneurs to import small value balancing equipment having a large impact on the quality and/or quantity of output, technical know-how, foreign consultancy services, drawing and designs and also any other input needed by industrial units for improving their export capability.

Units registered with DGTD or sponsored by authorities like the Textile Commissioners, etc. as well as licensed and scheduled industries will be eligible to take advantage of the scheme. To be eligible for this scheme, an enterprise will have to project its export capability and volume, the impact on cost reduction, capacity utilization, technology upgradation, rationalization of the product mix as well as modernization.

Earlier, the scheme was confined only to six industries. Now, virtually all kinds of industries will be able to take advantage of the scheme provided they fulfil the qualifications.

A special study of the benefits that have accrued showed that the units concerned have been able to reduce costs, improve quality, generate better technology, increase exports and modernize operations and processes, which together have resulted in better capacity utilization and economic viability.

The Ministry claimed that the response to the technical development fund scheme was encouraging. Certain industries, such as textile machinery, the automotive sector, castings and forgings, and machine tools, were taking interest in the scheme and are likely to benefit from it.

Under the liberalized scheme, foreign exchange will be allocated simultaneously with the approval of import, and no separate action seeking foreign exchange loans will be necessary.

Another feature of the revised procedure is that requests for foreign collaboration, import of capital goods, drawings and designs, as well as consultancy can be clubbed together without seeking approval from individual agencies as required under the normal procedure (Hindu, 31.8.78).

2.1.2 *Industrial Estates to Boost Small Sector*—In the annual session of the Shahdara Manufacturers Association, the Chief Executive Councillor Shri Kidar Nath Sahani announced that eleven functional industrial estates will be set up within the next three to four years to give a big boost to small scale and cottage industries in Delhi.

The industrial estates to be set up are: Functional Industrial Estate for Electronics; Testing and Development Centre for Electronics, Badli and other Rural Industrial Estates; Flatted Factories for Leather Goods; Ancillary Industrial Estate for Auto and Cycle Parts; Flatted Factories for Handicrafts; Functional Industrial Estate for Domestic Electrical Appliances; Flatted Factories for Young Entrepreneurs; Flatted Factories for Readymade Garments, Hosiery and Knitted Garments; and Flatted Factories for Printing and Bookbinding (F.E., 28.⌐78).

2.1.3 *Gold Replenishment for Jewellery Exporters*—A new scheme, aiming at replenishment of gold against the export of gold jewellery, will permit export of ornaments made of gold of 14 carats or higher purity and ensure a minimum value added of 33·3% over the value of pure gold content. All registered exporters of gems and jewellery, cooperative societies of certified goldsmiths and public sector corporations, both of central and state governments, operating as export houses will be eligible to avail of the scheme. In order to benefit the exports of studded jewellery, the government, along with this scheme, proposes an integrated scheme covering gold studded jewellery.

Gold will be sold through the State Bank of India, while prices will be fixed with regard to international markets.

For export licences, the eligible exporters may file their applications with the licensing authorities under the Chief Controller of Imports and Exports at Bombay, Calcutta, Madras and Delhi (F. E., 12.8.78).

2.1.4 *STC Consortium*—The State Trading Corporation's consortium of small units for exporting processed food, tea chests and boxes, plywood and jute products has so far exported plywood and tea chest panels worth Rs 5 crores to countries like Sri Lanka, East Africa and Iraq. The jute consortium of STC exported jute goods worth Rs 37 crores, against only Rs 7 crores last year.

Last year, the new consortium approach helped small scale units in getting a subsidy of Rs 15 lakh on processed food exports worth Rs 1 crore; previously it was received by the large export houses only.

The service charges of STC from small scale units are only 1% of the total value of exports.

To maintain uniform quality in the supplied products, STC is thinking of introducing some control measures. It is also setting up a leather research laboratory in Calcutta to increase exports of leather goods (F. E., 18.6.78).

2.1.5 *Modern Techniques for Jewellery Artisans*—The country's first gem and jewellery artisans training school, Jaipur, has been granted an import licence worth Rs 18 lakh to import latest equipment for use in shaping and polishing of gem stones. The equipment will be imported from Japan, USA and Germany.

There is great demand of trained artisans for cutting diamond and colour-stones. Because of limitations of equipments, only 50 out of 500 applications were considered by the training school this year. With the arrival of new equipment, the school will be in a position to admit 200 students at a time (E.T., 27.8.78).

2.1.6 *Newsprint Allocation Liberalized*—Under the new policy announced by the government for 1978-79, more concessions to small and medium newspapers will be granted for newsprint allocation. The important features of the new policy are as follows.

1. Newspapers, entitled up to 400 tonnes of newsprint may lift any proportion of their requirement from NEPA or imported variety.
2. The compulsory quota of NEPA newsprint for newspapers with an entitlement over 400 tonnes has been reduced to 15% of the total entitlement against 25% last year.
3. For imported newsprint, there will be compensation for wastage in transit and/or in machine room at 8% to newspapers published from Bombay, Calcutta, Cochin and Madras, at 9% to newspapers published from the states where these four towns are located, and at 10% to newspapers published from other states (F.E., 9.7.78).

2.1.7 *Concessional Customs for Electronics*—With effect from July 15, 1978, the Government of India has facilitated the electronics industry by extending concessional rate of customs duty of 45% *ad valorem* on imports of electronic raw materials. The concessional rate is applicable to: (i) silver powder suspension for manufacture of mica capacitor plates or mica capacitors; (ii) photoresist photopolymer films for manufacture of printed circuits; and (iii) silicone wafers, epoxide resins and silicone resins and photoresist for manufacture of diodes, transistors and similar semiconductor devices, and monolithic and hybrid integrated circuits [*Econ. Commrc. News*, 1978, **8** (30), 8].

2.1.8 *Excise Relief to Tyre Industry*—Taking into account the disadvantages felt by some units under present scheme of excise duty relief to the tyre industry, the Government of India has announced a new scheme. The new scheme will remain in operation till March 31, 1979.

The broad features of this scheme are summed up below:

1. The scheme envisages excise duty relief up to 12.5% for tyres and tubes produced before April 1, 1976 and up to 25% for those produced after April 1, 1976.
2. Only those factories whose licensed or installed capacity does not exceed 500,000 numbers of tyres and 500,000 numbers of tubes will be entertained by the scheme.
3. The scheme restricts 75% of the licensed capacity for home consumption [*Econ. Commrc. News*, 1978, **8** (30), 8].

2.1.9 *Export Units Outside FTZs*—The Commerce Ministry has formulated a special scheme to encourage establishment of 100% export oriented units to be set up outside Free Trade Zones. The scheme, which is the first of its kind, will be useful to both large and small scale units.

Compared to the world market, the home market will be more lucrative for the exporters to sell their products. The scheme has been designed to overcome this situation and to strengthen the production base for export. It also envisages the supply of critical inputs to exporting units at international prices which implies that there will be duty exemption particularly for capital goods import.

The rise in the capital cost of several projects is due to the cost of capital goods. With duty exemption for such goods, the capital cost will come down by 25 to 40%.

In order to ensure the success of the scheme, the government may also consider the liberalization of technology import for fully export-oriented units. In addition, the scheme will also eliminate procedural hurdles facing establishment of these units.

According to the Commerce Ministry, a 100% export-oriented readymade garment project can be set up for which synthetic fabrics could be imported with duty exemption. Another unit could be set up for exporting gold-studded jewellery (B. S., 8.9.78).

2.2 ENGINEERING INDUSTRY

2.2.1 *Rivet Clinching Machine*—British-made, Stanner pneumatically operated precision machine for use in the garage workshops and service depots speedily removes and clinches non-ferrous, hollow-type rivets when fitting new brakes or clutch linings for cars, commercial vehicles, motor cycles, earthmoving equipment and agricultural machinery.

It is available as a pedestal type or bench-mounted unit and holds most types of brake and clutch lining rivets with shank diameters of up to 10 mm. The machine operates from a compressed air supply and has a normal working pressure of 550 kPa (80 lbf/sq. inch).

The machine's working head incorporates an upper tool holding unit which carries punches for extracting or clinching rivets and a lower tool holding unit which carries an anvil for the clinching process. A simple pedal control mechanism governs the operation of the punches (Hindu, 28.8.78).

2.2.2 *Dry Air Generator*—Engineers of the Beas Project have designed and manufactured a dry air generator. This is the first time that such an equipment has been manufactured within the country and at a cost which is substantially below the quoted import price. The cost of the indigenously manufactured equipment is Rs 1 lakh as against the import price of Rs 7 lakhs.

The equipment will be used for dehydration of 400 kV transformer to be installed at the Dehar Power House of the Beas Sutlej Link Project and the Panipat 400 kV sub-station (F.E., 10.8.78).

2.2.3 *Temperature Controller*—Thermins mini indicating variable cycle temperature controller incorporates variable time proportioning action with offset correction.

In this, temperature stability is achieved through time proportion action. As the system temperature approaches the set-point, proportioning action gets initiated. With the variable cycle adjustment it is possible to regulate the on-to-off ratio of power input to suit the dynamic condition of the system, thereby enabling tight control of temperature.

It has an advantage over the simple on-off controller, in which the simple on-to-off ratio of power input is governed only by the thermal inertia of the system under control. This then leads to the overshoot and undershoot of temperature with respect to the set-point resulting in temperature difference which is many times more than the control differential of the instrument.

Thermins can offer a wide range of temperature instruments ranging from indicator to multipoint records (F.E., 10.8.78).

2.2.4 *Electrographite Carbon Brushes*—The National Physical Laboratory, New Delhi, has developed a method for the manufacture of electrographite carbon brushes for use in automobile dynamos, using indigenously available materials and machinery.

The main raw materials required in this process are electrographite/synthetic graphite, carbon blocks, petroleum coke, and coat-tar pitch.

The main items of machinery required are: pulverizer, ball mill, sieve shaker, cane blender, scales, sigma blade mixer, roll mixer, edge runner, pan mixer, moulding press, oven, furnaces, transformer (100 kVA), block cutting arrangement, and some test instruments [*Chem. Polymer Times*, 1978, **6** (7), 4].

2.2.5 *Gravity Welder*—Advani-Oerlikon has designed and developed a gravity welder for the first time in India. It is used for fillet welding of joints in the ship building industry. It can be operated on both AC and DC power source. High productivity can be obtained because three or more fixtures can be simultaneously operated by one unskilled person.

The gravity welder consists of a specially designed tripper which incorporates a sliding holder. The heavy flux coated electrode is fixed in the electrode holder, while its tip is rested against a point at the root of a tee-joint between steel plates. When the arc is ignited, the electrode starts to consume and, simultaneously, the holder slides downwards resulting in a continuous fillet weld in the joint. At the end of the welding operation, the electrode holder springs backward and withdraws the electrode automatically (B.S., 13.8.78).

2.2.6 *Strain Gauge Transformer*—Philips has introduced a new strain gauge transformer (PR 9865/000) for measuring compression or tension in metals. It has got several applications in the hot rolling mills and other areas where machines are subjected to severe mechanical stresses. It can also be used for force measurement in areas like die casting machines, presses, injection moulding, etc.

Both the unit and its connecting cable are resistant to petrol, diesel, salt water, detergents, and many other industrial contaminants. The sensitive measuring surface is protected by heavy nickel plating against corrosion.

The transformer consists of a metal strip which is fixed to the machine surface which is monitored. The strip has a milled recess which weakens it locally,

thereby emphasizing stress on it compared to that of the surface to which it is bolted. A foil strain guage in the classical full-bridge configuration is cemented to the weakened surface of the transformer and transmits the exaggerated compression or tension signals.

Further information can be obtained from: Philips India Ltd, S & I Department, 'A' Shivsagar Estate, Dr. Annie Besant Road, Worli, Bombay-400018 (B.S., 9.8.78).

2.2.7 *Liquid Level Controller*—India Engineering Co., has introduced an electronic liquid level controller, consisting of a control unit and a sensitive unit. The control unit is placed in the pump room and the sensitive unit in a container. They are then inter-connected with an ordinary 3-way unscreened cable. The sensitive unit's probing electrodes are immersed in the liquid to sense the change in resistance which in turn triggers the control unit.

The liquid level controller is available for control of one, two or more points. It is more suitable for suction tanks, delivery tanks, combined suction and delivery tanks.

It has high frequency switching, does not need probe head adjustments every time, and is simple to instal, accurate and reliable.

Further information can be obtained from: India Engineering Co., P.O. Box No. 161551, Worli, Naka, Bombay-400018 (B.S., 9.8.78).

2.2.8 *Ultrasonic Plastic Welding Machine*—Telesonic, Switzerland has developed an ultrasonic plastic welding machine (USP-1) which is useful for inserting of metal parts in plastic, riveting of plastic to plastic or plastic to metal, spot welding of plastic parts and outing of injection moulded parts from their gate trees.

The new system is made up of an electronic ultrasonic generator, timer and machine control system, transducer, acoustic transformer, horn and pneumatic press.

In operation, the horn exerts strong mechanical micro-oscillations on the part to be welded. The energy thus released is converted into frictional heat, which binds the plastic parts together. The welding period is only 0.1 to 2 sec.

Among other facilities the new equipment is simple to instal and maintain and has high operational reliability [*Plast. Ind.*, 1978, 3 (9), 29].

2.2.9 *Ophthalmometer*—The Central Scientific Instruments Organization, Chandigarh, has developed an ophthalmometer to measure radii of curvature of the interior surface of the cornea, its refractive power, the positions of the two principal meridians of an astigmatic cornea, and corneal refractive power in each of the two principal meredians. The instrument can, therefore, be used in ophthalmological research centres, eye hospitals, optical clinics, etc. With proper quality control the ex-factory price of the newly developed Instrument comes out to be Rs 4,000 while the selling price of an equivalent imported instrument is about Rs 10,000.

The present estimated demand, which is being met entirely through imports, is nearly 10 pieces/yr (F.E., 7.8.78).

2.2.10 *Weather Transcriber*—The Electronics Corporation of India has developed a weather transcriber, used as ground equipment at airports for continuous broadcast of weather information over radio transmitters for incoming/outgoing aircraft. The equipment is capable of recording verbal messages of variable duration (up to a maximum of 5 min) on an endless magnetic tape. The tape runs at normal speed in presence of a message and four times the normal speed in absence of one, thus reducing the silence time between two repeated messages. In case of breakage and jamming of tape, the equipment gets switched off automatically (F.E., 31.7.78).

2.2.11 *Water Brake Dynamometer*—S.A.J. Steels (P) Ltd, situated on Pune-Satara Road, has developed a water brake dynamometer which is one among 11 winners of this year's Independence Day Awards for import substitution.

The Pune firm has developed a range of dynamometers in fifteen different models with capacities up to 1,350 h.p. The firm has designed some special dynamometers such as the Chassis Dynamometer for testing complete vehicles (E.T., 29.8.78).

2.2.12 *Tube Lantern*—A Bombay firm has introduced Instatube, a fluorescent tube lantern fitted with 6 W tubelight and working on dry power battery. The new lantern contains a magnetic regulator and works automatically in case of sudden power failure of A.C. mains.

Further details can be had from : Test Equipments (Elec.) Pvt. Ltd, Katara Mansion, 132-A, Dr. Annie Besant Road, Worli, Bombay-400018 (E.T., 29.8.78).

2.2.13 *Lime Concrete Tamping Machine*—The Central Building Research Institute, Roorkee, has developed a machine to mechanize the process of tamping lime concrete terracings. The parameters of the machine are as follows :

Prime mover: electric motor of 0.5 h.p., Number of tampers: 3, Number of blows: 1000/min, Self weight: 70 kg approx., Length (excluding) handle: 500 mm,

Width: 430 mm, Height: 300 mm, and Output: 50 sq. m/hr.

The machine works on the principle of cam and follower mechanism. A rotating cam allows the follower to rise and drop. The tamper attached with the cam blows lime concrete while the follower drops. Such repetitive blows compact the lime concrete.

The main advantages of the machine are its uniform compaction at a high rate and good surface finish. It is easy to handle, need-based, cheap and useful also for consolidating sub-floors of lime concrete (E.T., 29.8.78).

2.2.14 *Solar Cell Modules*—The Central Electronics Ltd, has started fabrication of solar cell modules which may generate 7 peak watts for charging 12 Volt lead acid batteries. These modules, when put in parallel series with the batteries, form photovoltaic systems which may be used in rural water pumping, T.V., defence communications and microwave repeater stations.

CEL has also developed a pocket *Suryamapi* for measuring solar intensity [*Econ. Trends*, 1978, 7 (13), 44].

2.2.15 *Automatic Fuse*—With the development of Siemens' PTC resistor-fuses for voltage not more than 33 V and current around 400 mA, there is no need to replace a blown fuse. On termination of overload condition the operating condition is automatically restored.

The new fuses, measuring 7mm × 7mm with a maximum thickness of 2.5 mm and containing 25 mm long terminal leads, can directly be inserted into circuit. The reference temperature at which the resistance suddenly shoots up is 120°C. The continuous current in the protection condition remains below 100 mA.

For further details contact : Siemens India Ltd, 6 Little Russell St, Calcutta 700071 or Siemens D-8000 Munich 1, Federal Republic of Germany [*Econ. Trends*, 1978, 7 (13), 42].

2.2.16 *Fire Sense*—This instrument, based on the use of heatsensing cable, has been fabricated to protect processing plants where local overheating of bearings or other components might occur. The instrument is cheaper, simpler and more efficient than anyone of its type now available. It is suited for all types of industrial complex, buildings and even domestic property.

The equipment comprises coaxial cables, the insulation of which is of a special formulation, linked to electronic alarm units (monitors) contained in cabinets which may be located anywhere in the affected area.

The cable is claimed to be equally effective for all distances. If a cable is damaged by fire or other event only affected portion need replacement.

Apart from indicating the location of fire and initiating an alarm, the monitors can help in automatic closing of doors and shutting down of automatic processing equipment.

One more advantage of the instrument is a new arrangement called Fire Sense Dualine, in which the cable is not only a detector cable but also a current conducting line. The facility with this arrangement in that if heat detecting core is destroyed, the conductor core will continue to serve control circuits.

For further details contact : Patol, P.O. Box No. 66, Reading, Berks RGI 1 PE, England [*Econ. Trends*, 1978, 7 (13), 41].

2.2.17 *Solar Control Glass*—Pilkington Brothers have developed the first monolithic solar control glass. Due to its low solar heat absorption and high reflectivity, as much as 43%, the material is suitable for all climates. Secondly, the glass could be used to glaze the whole facade of a building, including cladding panels, as it reduces the danger of glass shattering through thermal stressing. While using the new material with low light transmittance glass like Antisun float grey, it provides excellent one-way mirror effects for security work.

The glass may reduce solar heat by 40% and transmit 67% of incident light. Incorporated into double glazing units, the material will provide heat insulation as well as light transmittance of 29% and total solar heat transmittance of 44%.

For further details contact : Pilkington Brothers, Prescot Road, St. Helens, Merseyside WA 10 X 3 TT, England [*Econ. Trends*, 1978, 7 (14), 51].

2.2.18 *Testing Carbon Equivalent*—Ajay Metachem Pvt. Ltd, has developed Metasup-Ce-System for quick and accurate determination of carbon equivalent of molten iron.

The method is based on recording of a point where liberation of latent heat starts while cooling of liquid iron. This thermal arrest point is directly related to the carbon equivalent of the iron.

The carbon equivalent is useful for control of fluidity, hardness, mechanical properties and machineability [*Econ. Trends*, 1978, 7 (14), 52].

2.2.19 *Electro-discharge Gate*—A British firm has developed a sliding-gate hopper outlet metering

device for rapid and highly accurate loading of a wide range of free-flowing materials into road and rail wagons. This newly developed Electro-discharge Gate is capable of handling throughputs of up to 2,000 tonnes/hr.

The device is useful for robust quarry and mining work and for powdered and dusty materials, ranging from 200 mm square,

The importance of the gate is that a light emitting diode readout records the weight entered into, and the unit cuts off automatically when prescribed weight has reached. The gate opens at 100 mm/s and throughput is determined using a capacity-time graph. Stepless electrical control during opening and closing of the gate adds to accuracy. Maintenance is claimed to be minimal as all bearings are sealed. The moving parts of the gate remain free from contamination.

Further details can be obtained from : Locker Industries Ltd., P. O. Box 161, Warrington WA 1 2 SU, England (B.S., 20.8.78).

2.2.20 *Multi-purpose Hydraulic Presses*— A British firm has designed a range of compact, self-contained hydraulic presses which may be operated directly from standard compressed air of 550 k Pa. Their outstanding features are high degree of accuracy and consistent repetitive performance. Other facilities are low weight, provision for silencer, and inching facility. The incorporation of a force intensifier unit in place of hydraulic pumps has lowered their price also.

The presses are useful for industries engaged in light production or assembly work involving metal or plastics components. They can be installed either singly or in series as part of an automatic multi-station production/assembly system. Individual applications are punching, piercing, clipping, crimping, indenting and cropping.

Supplied in four frame sizes, the 11 models in the standard range provide press capacities variable up to 2.5, 5 or 10 tonnes, stroke lengths variable up to 20 mm, 40 mm or 65mm, stroke rates variable up to 19.40 or 50 strokes/min., and adjustable shut heights variable up to 170 mm, 225 mm or 265 mm.

The smallest (2.5 tonne) press is 255 mm wide × 415mm deep × 770mm high and weights only 135 kg (297 lb); the 10-tonne model with the largest frame (D) measures 365 mm wide × 508 mm deep × 1194 mm high and weighs 265 kg (585 lb).

For further details contact : Jervis Engineering Company Ltd, Kingsbury Road, Midlands, Minworth, Sutton Coldfield, West Midlands, B 76 9DF, England (B.S. 20.8.78).

2.2.21 *Microdip Switch*—EECOUS/UK has brought out microdip switches which are world's smallest coded dual in-line switches.

The switches provide for economical and space saving approach to programming electronic equipment. The device is compatible with the latest techniques in printed circuit boards, including multi-layer boards, inter-connects, socket-pins and receptacles. Miniaturization and dust seal design in the new equipment make soldering and cleaning easy.

For further details contact : Eclbee Corporation, Kamer Bldg, 5th Floor, 38 Cowasji Patel Street, Bombay-400001 (F. E., 21.8.78).

2.2.22 *Automatic Wrapping Machine*—The Engineering Development Division of Hindustan Lever has developed a twin-turret automatic wrapping machine fully indigenous at almost half the cost of an equivalent imported machine.

The machine can wrap near brick-shaped units like soaps, detergent cakes with reel-fed waxed wrapper at rates as high as 120/min.

The machine is robustly built and has a centralized control panel including a photo-cell scanner to control the fixed registration of the wrapper print in relation to the unit (F.E., 10.9.78).

2.3 CHEMICAL INDUSTRY

2.3.1 *Chemicals Export*—During April-June 1978 the exports of chemicals, pharmaceuticals and allied products was worth Rs 2,849 lakhs as compared to Rs 2,120 lakhs for the corresponding period last year. Export of medicinal castor oil showed the maximun rise from Rs 632 lakhs to Rs 1,496 lakhs, i.e. 136%. Inorganic and organic chemicals export registered an increase of 15% by rising in value from Rs 425 lakhs to Rs 489 lakhs. Proprietary and patent medicines, anthraquinone, carbon black, potassium permanganate, aluminium phosphide, insecticides, toilet soaps, fatty acids, etc. were the items which contributed to the export boost.

However, the exports of dyes and intermediates, alcohol, coal-tar products, glycerine, cosmetics and toileteries and essential oils were not encouraging.

The major buyers of Indian chemicals and pharmaceuticals were USA, UK, West Germany, Italy, Japan, USSR, Kenya, Malaysia, Bangladesh, Sri Lanka, Pakistan and some Arab and African countries [*Econ. Commerc. News*, 1978, 8(32), 5].

2.3.2 *Calcium Carbide*— A Rs 6.23 crore calcium carbide project is being set up at Kallur near Karnool (A.P.) by a joint sector company, Andhra

Pradesh Carbides, with an initial installed capacity of 27,000 tonnes/yr.

The process will be electrothermal. The furnace and the main plant is to be imported from USSR. The erection of the plant and machinery is expected to be completed by November 1978. Commercial production is expected by the end of this year [*Industr. Develop. News*, 1978, **13**(5), 57].

2.3.3 *Fertilizers*—A naphtha-based ammonia-urea complex costing nearly Rs 168 crores being set up in Phulpur near Allahabad by the India Farmers Fertilizer Cooperative Ltd (IFFCO) is expected to start production in 1979. The plant will have an annual capacity of 500,000 tonnes of urea.

IFFCO has been allocated another fertilizer plant based on natural gas from Bombay High (Bassein). The preliminary work of this Rs 230 crores ammonia-urea plant has already started. Commercial production is expected within 4 years.

IFFCO is also contemplating the manufacturing and marketing of pesticides like malathion [*Industr. Develop. News*, 1978, **13** (5), 58].

2.3.4 *Algae Farm*—Israel is first to commercialize an algae farm, which recovers beta-carotene and glycerine from algae leaving a byproduct of protein meal [*Chem. Ind. Develop.*, 1978, **12** (6), 40].

2.3.5 *New Molecular Sieve*—Union Carbide, USA, has developed a molecular sieve made of a polymorph of silica and of a special crystal structure. It repels water and absorbs small molecules like benzene and is probably useful for waste water treatment and similar applications [*Chem. Ind. Develop.*, 1978, **12**(6), 40].

2.3.6 *New Ethylene Oxidation*—Halcon (USA) has recently commercialized a process for ethylene oxidadation to glycol, presumably using thallium salts as the catalysts. According to Belgian Patent No. 853863, epoxides are formed by oxidising an olefin, using arylthallic carboxylate in polar organic solvent containing water. Another patent 853864 refers specifically to ethylene oxide from ethylene and thallic alkanoate in liquid turbulent medium containing water and an alkanoic acid. Patent No. 855127 also refers to thallous compounds being converted using organic peroxide or oxygen with noble metal catalysts [*Chem. Ind. Develop.*, 1978, **12**(6), 40].

2.3.7 *Blue Ultramarine*—The process for blue ultramarine covered under Indian Pat. 303/Cal/75 (S.B. Chaudhry and B.K. Saikia, Regional Research Laboratory, Jorhat), involves thorough mixing of finely ground kaolin, sodium sulphide and carbon in a definite proportion with a catalyst and calcining the product at 300°C for 3 hr. This process is superior to others due to rapid production of ultramarine blue. The process has been standardized on a bench scale.

Blue ultramarine is useful in interior paints, toner, whitener, enamels, emulsion paints, special kinds of printing inks, laundry bleaches and in paper-making (F.E., 21.8.78).

2.3.8 *Food from Dicalcium Phosphate* (*DCP*)—The Food Corporation of India is using 200 million tonnes of food grade DCP for producing *Balahar*, a nutritive food for children.

Food grade DCP, obtained from natural phosphate rock, is primarily impure due to the presence of significant amount of fluorine and other organic matters. The Chemical Research Wing of the Planning & Development Division of the Fertilizer Corporation of India has studied this problem and evolved an economical process. Interested persons are advised to contact the aforesaid Wing of FCI, Sindri (F.E., 18.6.78).

2.3.9 *Process for Ampicillin*—The Central Drug Research Institute (CDRI), Lucknow, has developed a process to manufacture ampicillin. Ampicillin is a drug for infections, resistant to other antibiotics.

According to an Institute spokesman, India was importing till last year 45 tonnes of ampicillin worth Rs 80 lakhs annually. Till last year, India produced only 7 tonnes/yr of the drug. By 1982-83, the demand of ampicillin would be 105 tonnes (F.E., 9.7.78).

2.4 MISCELLANEOUS INDUSTRIES

2.4.1 *Solar-based Cold Storage*—The Mechanical Engineering Department of the Indian Institute of Technology (IIT), Powai, Bombay, is making a cold storage unit based on solar energy with immense potentialities for widespread use in the rural areas. It is expected to be completed by early 1979.

The unit being developed at IIT on experimental basis is a small half-tonne refrigerator that can preserve commodities stored in a $20 \times 15 \times 12$ ft room. It will be a self-contained unit, unlike other cold storage units which require power from the conventional sources.

The solar powered cold storage unit, if it becomes commercially viable, will essentially be of a community type for use by groups of farmers and will work out cheaper compared to the conventional types of cold storage units [*Engng Times*, 29.6.78; 6.7.78].

2.4.2 *Polyester-jute Fibre for Fishing Boats*—The Department of Science and Technology is developing polyester-jute fibre for making fishing boats.

According to Marine Products Export Development Authority, six national research institutes are associated with the project under a United Nations

development programme. According to departmental study, a small boat which can carry one tonne of fish could be made of jute reinforced with plastics at a cost of Rs 2,000, which would last for 15 to 20 years.

Jute is used in the form of woven cloth and yarn. When wetted with polyester resin and cured, the resulting material becomes light, stiff and strong and is not affected by moisture, heat and fire (B.S., 2.8.78).

2.4.3 *Janata Bio-gas Plant*—The Indian Council of Agricultural Research in collaboration with the National Committee on Science and Technology has developed a Janata bio-gas plant, which is cheaper, cleaner and more efficient than the conventional model. The installation cost of such 2 cu. m plant is Rs 682 against Rs 2,332 of the conventional type.

The Janata plant is suited not only for cattle dung and soil but can produce bio-gas from organic materials, crop residues and water plants [*Econ. Trends*, 1978, 1 (13), 44].

2.4.4 *Rich Source of Tungsten*—According to a recent survey conducted by the Rajasthan government, the hills near Degana in Nagaur district have plenty of tungsten of good quality. In 1976, of 44 3 tonnes of tungsten produced in India, the State of Rajasthan alone produced 36.6 tonnes, i.e. 82% of the total production.

Some deposits of tungsten have also been reported from Bankura district of West Bengal (E.T., 30.7.78).

2.4.5 *Good Market for Leather Goods Abroad*—According to a study team sponsored by the Trade Development Authority, Indian leather goods, particularly machine-made wallets, are in demand in Australia and Japan.

The team suggests mechanisation of leather industry in order to compete in the Japanese market (F.E., 4.9.78).

2.4.6 *HEPA Filters for Pollution*—High efficiency particulate (HEPA) filters, developed by the Bhabha Atomic Research Centre for nuclear installations, are finding wide applications for industries sensitive to micron level particulate pollution as well as for electronics and pharmaceuticals industries.

Pollution control mechanism is more or less similar in both nuclear and conventional industries. For high level pollution control, the concepts and equipments used in nuclear installations can be adopted wholly or with minor changes.

At present, HEPA filters are being manufactured on a commercial scale by some private industries (F.E., 21.8.78).

2.4.7 *Mustard Powder*—The Central Food Technological Research Institute (CFTRI), Mysore, has developed an improved process for mustard powder.

The raw material is bold, black-yellow mustard seed of good quality. The main equipment are seed grader, kettle drier, plate mill grader, classified triple roll mill and boiler. Both raw material and equipment are indigenously available.

The process consists of the following steps: conditioning graded seed to loosen the husk; splitting and dehusking conditioned and dried seed; and screening and air-classifying the mixture of husk and cotyledons to desired fineness to obtain mustard powder.

According to CFTRI, the minimum capacity of an economic unit for an 8-hour shift/day is 500 kg of mustard powder, for which capital investment is Rs 5.21 lakhs comprising Rs 2.30 lakhs on plant and machinery and Rs 2.91 lakhs as working capital. The cost of production is Rs 725/quintal of mustard powder.

Further particulars can be obtained from: Managing Director, National Research Development Corporation of India, 61 Ring Road, Lajpat Nagar III, New Delhi-110024 (F.E., 21.8.78).

2.4.8 *More Copper Arrival*—According to Minerals and Metals Trading Corporation, India will be importing 75,000 tonnes of copper by March, 1979, of which 15,000 tonnes will be arriving by October this year.

Present demand of the metal has gone up by 50% over its demand last year. In Bombay alone, registration for requirements with Hindustan Copper Ltd, has touched 2,000 tonnes in the month of July against the normal monthly requirement of 300 to 350 tonnes.

At present, ruling market price of copper is Rs 29,000 a tonne against the official Hindustan Copper price of Rs 23,750/tonne (E.T., 20.8.78).

2.4.9 *Rural Units' Output Up*—The output of Khadi & Village Industries (KVIC) went up by 14% in 1977-78, valued at Rs 270.34 crores as against Rs 226.76 crores last year. The production of village industries alone was worth of Rs 206.24 crores recording an increase of 20% over the previous year's production of Rs 171·73 crores.

In 1977-78, KVIC generated 3.15 lakh additional jobs. In order to create self-employment, the government is extending financial assistance to individual artisans through the implementing agencies.

With a view to developing village industries, KVIC is planning—faster development of handlooms,

non-edible oils, soaps, match and leather industries (F.E., 4.9.78).

2.4.10 ***HMT Watch Assembly Unit for Orissa***—According to Industry Minister, Mr. George Fernandes, Hindustan Machine Tools (HMT) will set up a watch assembly unit and a rural industrial centre in Orissa. The Minister told that Bharat Heavy Electricals Limited was also proposing to set up an electrical insulation unit based on large reserves of china clay in the State. According to him, two mini-cement plants may also be set up in the State (F.E., 18.8.78).

2.4.11 *Watch Case Unit for H.P.*—Khanna Watches Limited, a new stainless steel watch case plant with technical know-how by a French firm SBBM Burdet is coming up at Parwanoo, Himachal Pradesh. The unit is estimated to cost Rs 1.30 crores. It is expected to produce one million cases a year (F.E., 7.7.78).

2.4.12 *R & D Organizations for Small Industries*—The Birla Institute of Science has set up a Small Industries Research and Development Organization (SIRDO), with a view to assisting young entrepreneurs in setting up independent small units, the emphasis being on the promotion of rural-based industries. SIRDO has established such centres, at Malvia Industries Area of Jaipur and at Naini, Allahabad.

The Jaipur Centre is concerned mainly with electrical and electronics engineering fields. This centre is developing know-how and prototypes of many instruments. The Allahabad unit has been developing know-how for various products and setting up small industries. Another such SIRDO centre at Mesra, Ranchi, is functioning for studying industrial needs and developing appropriate processes and equipment [*East. Economist*, 1978, **11**(3), 132].

3. ANNOUNCEMENTS

3.1 Award

Top Exporter Award 1976-77—The Polyolefins Industries has won the top exporter award for high density polyethylene (HDPE) pipes for the year 1976-77.

The export of HDPE pipes during the period April 1976 to March 1977 has fetched a record of Rs 26.33 lakhs in foreign exchange earning against Rs 19.56 lakhs in 1975-76.

3.2 Exhibitions and Fairs

3.2.1 *Home-makers' 79 International Furniture and Furnishing Exhibition* will be held in the World Trade Centre in Singapore from April 7 to 11, 1979. It will provide an opportunity for preparing grounds for export of furniture and furnishings.

Further details can be obtained from Home-makers' 79, Scope International Pvt. Ltd Suite 504, Eng Cheong Tower, North Bridge Road, Singapore-7.

3.2.2 *The Fifth International Foundry Trade Fair* will be held at Dusseldorf (West Germany) from June 9-15, 1979.

Interested participants may contact: Indo-German Chamber of Commerce, 86, FG Himalaya House, 23 Kasturba Gandhi Marg, New Delhi-110001.

3.3 Publications

3.3.1 *The Textile & Engineering Directory, 1976-77*, Manek Mahal, 6th Floor, 90 Veer Nariman Road, Churchgate, Bombay-400020. Price Rs 60.

It covers information about cotton, silk, man-made fibre and jute mills with details of bleaching, dyeing, printing and mercerising, in addition to a separate section on processing houses.

Details of textile trade organizations and associations, purchase guide and catalogue of textile machinery, mills stores, spares and accessories dyes and chemicals and oils are its important features. The directory contains statistical guide and technical references also [*Commerce*, 1978, **132** (3501), 132].

3.3.2 *Operational Summary of Proposed Project on Business Opportunities* (a quarterly publication), John Hopkins University Press, Baltimore, USA; Subscription fee, $ 20/yr.

The new publication will disseminate information on projects assisted by the World Bank and International Development Association (IDA) to help suppliers to find sales opportunities.

The journal will include: (i) projects that the Bank and its affiliate, IDA, are actively considering for financial assistance with a brief description of each project, (ii) the member country and the agency responsible for the project, (iii) the amount of financing to be provided and co-lenders, if known, and (iv) the stage to which a proposed project has progressed, i.e. identification, feasibility, appraisal, negotiation, approval and procurement.

The publication will add up-to-date information on bank and IDA activities for businessmen, industrialists, and consultants as well as private financial institutions (F.E., 7.7.78).

3.3.3 *Investment Decision*, by Minoo R. Batliwalla, Asia Publishing House, Bombay. Pp 512. Price Rs 75.

The publication, written with a view to explaining capital budgeting with the aid of the Discounted Cash Flow (DCF) technique is a welcome addition in a small list of such publications. In its 23 chapters, the book underscores financial management, specially investment decisions, mathematical details like interest, annuity, etc., finacial accounting, DCF, cost of capital valuation concept and other traditional cash flow methods. The book may serve as a reference source for management institutes, research students and finance managers (E.T., 20.8.78).

3.4 Conference

The Tenth Rubber Conference organized by the Indian Rubber Manufacturers' Association, Thana, will be held on December 14, 15 & 16, 1978 at Ahmedabad.

It will cover various aspects of the rubber industry in five sessions on polymers, chemistry and technology of rubbers, compounding of ingredients, product development, standardization, and machinery and testing equipment.

Further information can be obtained from : The Indian Rubber Manufacturers Research Association, Plot No. B-88, Road No. U, Wagle Industrial Estate, Thana (Maharashtra).

Vol. 1 No. 12 Dec. 1978

INDUSTRIAL NEWS DIGEST

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PUBLICATIONS & INFORMATION DIRECTORATE, CSIR
Hillside Road, New Delhi-110012

Announcement

We are happy that there is a progressive rise in the number of readers of the *Industrial News Digest*. However, as we now have to print larger number of copies, our cost of production has increased considerably. Consequently, we are forced to price the *Digest* from the January 1979 issue at Rs 20.00/£ 4.00/$ 8.00 per annum and Rs 2.00/£ 0.50/$ 1.00 for single copy.

To the readers who have already expressed their desire to subscribe, the relevant forms, etc. are being sent. Other readers who want to subscribe to the *Digest* may please write to the Editor, Industrial News Digest, Publications & Information Directorate, Hillside Road, New Delhi 110012.

INDUSTRIAL NEWS DIGEST

Vol. 1 No. 12 December 1978

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Industrial News Digest is a monthly bulletin issued by the Publications & Information Directorate. A part of the Industrial Information Service of the Directorate, the *Digest* aims at providing packaged, down-to-earth technological and techno-economic information to industrialists, prospective entrepreneurs, and experts in both government and private agencies dealing with the management and planning of industry. Queries on technical and techno-economic matters are welcome.

CONTENTS

Publications & Information Directorate CSIR, Hillside Road, New Delhi 110012

ABBREVIATIONS USED

B.S.	Business Standard
E.T.	Economic Times
F.E.	Financial Express
H.T	Hindustan Times

Standard abbreviations are used in case of all scientific and industrial periodicals.

1. INDUSTRY PROFILE

CEMENT INDUSTRY

Cement is one of the most important raw materials for building houses, factories, dams, canals, roads, bridges and many other civil and defence constructions.

Production of cement started in India with the setting up of a cement factory near Madras in 1904. Since then the industry has come a long way. At present, the Indian cement industry ranks ninth in the world production of cement. The leading cement producing nations of the world are: USSR, USA, Japan, West Germany, Italy, France and Spain. However, the per capita consumption of cement in India is the lowest at about 28%. A random sampling of the consumption of cement of 29 countries, carried out in 1975, showed that the leading per capita consumers are Belgium (703 kg), Hong Kong (132 kg) and Thailand (95 kg).

Growth of the Industry

During the First Plan the capacity of the cement industry grew by about 9% per annum and the actual production and capacity achieved at the end of the Plan were close to the respective targets. In the Second Plan, the rate of growth was around 13%, but actual production and capacity were far below the targets set. In fact, the Second Plan targets were realised only by the end of the Third Plan.

The rate of growth declined to 5% in the Third Plan and rose again to a little over 7% in the three years of plan holiday (1966-69) and the Fourth Plan. But the rate of growth was too slow to make any impact either on increasing the production or capacity. In the last two years of the Fourth Plan the level of installed capacity remained stationary with the number of units remaining unchanged at 49.

During the first 4 years (1974-77) of the Fifth Plan the annual rate of growth (capacity-wise) was only about 2-3%. The Fifth Plan Document placed the capacity target at 235 lakh tonnes. Subsequently, the working group on cement industry constituted by the Planning Commission reviewed the position of demand and concluded that the demand of cement will be about 239 lakh tonnes by 1978-79. The capacity, production and capacity utilization of the cement industry during the seventies are discussed later.

Present Status

At present there are 55 cement factories in the country. The industry is dominated by the private sector which controls 45 factories with the Associated Cement Company owning 17 of these.

Consumption—The cement factories are predominantly located in the southern and western States of the country (there are 20 factories in the southern region). The States in the southern and western regions of the country have traditionally been surplus ones, while those in the northern and eastern regions deficit ones. The factories in the southern and western regions account for nearly 68% of the total cement production. The consumption in these regions, however, amounts to only about 50%. On the other hand, demand for cement in the northern and eastern regions of the country exceeds the production there. The region-wise production and consumption of cement in 1976 are given in Table 1.

Production—Figures for installed capacity, production and capacity utilization of cement for the period 1973-77 are given in Table 2. It can be seen that there was a fall in production by 6.6 lakh tonnes during 1974. Since then production of cement has increased steadily, thanks to better capacity utilization. However, even the production of more than 190 lakh tonnes of cement during 1977-78 was not enough to meet the demand and the shortfall had to be made up through imports.

TABLE 1—REGION-WISE PRODUCTION AND CONSUMPTION OF CEMENT IN 1976

(Qty in lakh tonnes)

	Production	Consumption	Surplus/Deficit
Northern	27.07	53.63	−26.56
Eastern	30.36	33.64	−2.28
Western	57.98	43.38	14.60
Southern	70.73	46.70	24.03
Total	186.14	177.35	8.79

TABLE 2—CAPACITY, PRODUCTION & CAPACITY UTILIZATION

(Qty in lakh tonnes)

	Installed capacity	Production	Capacity utilization (%)
1973	197.4	149.9	76
1974	198.6	143.3	73
1975	211.1	163.4	77
1976	214.2	186.1	87
1977	218.7	190.8	87

Future Scope

According to the working group on cement industry constituted by the Planning Commission, the demand for cement will be about 239 lakh tonnes at the end of 1978-79. The Minister for Industry, Shri George Fernandes, has predicted that the gap between demand and supply of cement would be 41.7 lakh tonnes in 1979-80, 42.6 lakh tonnes in 1980-81 and 39.2 lakh tonnes in 1981-82.

The Ministry of Industry is convinced that there exists considerable scope for expansion in the cement industry in view of the anticipated requirement of cement during the next 5 years. However, the Ministry had laid down the following guidelines which should be followed when considering proposals for additional capacity.

1. Utilization of low grade limestone after beneficiation, especially in deficit areas, should be encouraged.

2. Having regard to the implications of transport of cement over long distances, proposals for locating clinker grinding capacity near the centres of demand, on the basis of movement of clinker from location which have advantage of raw materials etc., would be considered.

3. Proposals for additional capacity should cover detailed information regarding the quality and extent of limestone deposits. Entrepreneurs are, therefore, advised to consult, in the first instance, the State Mining Department, Geological Survey of India and other concerned organizations regarding limestone surveys.

4. Import of cement machinery must not be permitted.

5. There is saving in coal consumption to the extent of 27% in the dry process as compared to the wet process. The choice of process is also dependent upon other factors such as the quality of limestone and availability of water. Wherever possible and economic, the dry process should be adopted.

6. The standard capacity of cement plants has been 1000-1200 tonnes per day, but in special locations, depending upon the availability of limestone and other factors, smaller capacity of about 600 tonnes per day would be considered. There is considerable potential for export of cement to the neighbouring countries. Proposals for large coastal plants mainly geared for exports should be considered on merit.

7. Installation of mini cement plants, using either rotary or shaft kiln process should be encouraged for locations having small deposits of limestone and having limited demand.

8. Special consideration should be given to proposals aimed at: (i) locating cement capacity in deficit areas; (ii) utilization of industrial wastes lik blast furnace slag and fly ash; (iii) rationalization o locations on the basis of split-locations, whereve feasible; (iv) reduction in the incidence of packing co by resorting to bulk distribution of cement and suppl of ready-made concrete mixtures; (v) maximization o production out of the existing facilities throug technological improvement, conversion from we process to dry process, balancing and modernizatio

There is no need for foreign collaboration in th industry, as adequate consultancy services ar available within the country.

The present slackness in production of cement i mainly due to power shortage, bottlenecks in th transportation of raw materials and fuel, and labou trouble. Apart from successful tackling of thes problems, the production can also be substantiall increased by adopting improved technologies like th dry process and introducing precalcinators.

There is ample scope for better performance an productivity in the industry because the basic input viz. raw materials, power, fuel and machinery, ar indigenously available in the country. The entir production is sold without any difficulty except durin rainy season and when the government demand (abou 40% of the total production) is slack. Moreover, there i demand for the product in the neighbouring oil-ric west Asian countries which have embarked upo ambitious development programmes.

Exports & Imports

Small quantities of cement and clinker are exporte mainly to Iran, Iraq, Egypt, Saudi Arabia, many oth Middle East and Gulf countries, and Banglades Exports are canalised through STC. The quantity to b exported is earmarked after taking into consideratio domestic demand and supply at the beginning of eac financial year. Under the joint marketing arrangemen export contracts are then concluded by STC and th cement manufacturers. Export figures for cement fo the last 3 years are given in Table 3.

It can be seen from the Table that there has been continuous increase in cement exports during the last years. But for the sudden spurt in domestic demand i recent years, the country could have done far better o the export front.

TABLE 3—EXPORT OF CEMENT

	Qty (in lakh tonnes)	Val. (in Rs lakhs)
1975	3.01	858.17
1976	3.86	1423.26
1977	8.19	2718.15

There was practically no import of cement during 75 and 1976. However, due to the gap between mand and production in 1977, substantial amount of ment had to be imported from USA, The etherlands and West Germany.

lini Cement Plants

This is the most important development in the ement industry in recent years. With the rising cost of arious inputs entrepreneurs found that only large lants were becoming economically viable. However, ecause of the larger financial outlay and long estation period required, new plants have not been oming up at the needed rate, thereby resulting in hortage of cement. Moreover, large capacity plants annot be sustained by small raw material deposits which are, in such case, likely to remain untapped. This ituation demanded research and development work on the feasibility of mini cement plants. Pioneering work in this direction was started by the Cement Research Institute (CRI), New Delhi.

There are several advantages of setting up mini cement plants: (i) bringing cement industry within the financial access of smaller entrepreneurs; (ii) creation of ncreased employment opportunities in rural areas on well dispersed basis; (iii) increased availability of cement in rural areas for construction purposes with low transport cost; (iv) development of the local economy at the grass-roots level; (v) realization of quicker returns on capital invested because of low gestation period, (vi) exploitation of small and medium size deposits of limestone scattered all over the country with limited requirements of power and water; (vii) reduction of strain on the country's transportation infrastructure, which is already poor in many areas; (viii) lower capital investment per unit of capacity and less time for erection and operation; (ix) avoidance of wasteful movement of materials, thus bringing down the average unit cost of transportation; and (x) reduction in packaging charges as the area of utilization is restricted.

Although the production cost is higher for mini cement plants, they can be very attractice in several situations specially when the cost to the consumer is considered. The capital, production and labour costs are higher for mini cement plants as compared to conventional cement plants. But they score over conventional plants in respect of transport, handling and packaging costs. Mini cement units also have minimal godown charges to pay.

There are at present 6 mini cement plants in the country in various stages of operation. however, these plants are being operated mainly on an experimental basis to study their viability. Of these, the unit at Porbander produces white Portland cement exclusively, while the unit at Wuyan in J&K, based on the Lurgi sinter bed process, is producing ordinary Portland cement. The other mini cement plants are at Jorhat, Mohanlal Ganj in UP, Baroda, and Modurathur in Tamil Nadu. While the first two are in regular production, the four others are still in experimental stages.

Fifteen mini cement plants with daily capacities ranging between 50 and 100 tonnes are expected to be commissioned between May 1979 and March 1980. Out of these nearly half are in the private sector. The rest are in the public sector, mostly promoted by State governments.

Recently, CRI has submitted to the Industry Ministry a report based on a nation-wide study of the potential sites for mini cement plants. The report gives state-wise location of deposits, estimated reserves of limestone, economically viable capacities of plants at each site, and the radii of the anticipated markets. In the light of this report, the Ministry has identified 90 sites for setting up mini cement plants throughout the country.

Technology—At present, there are two technology choices available: (i) rotary kiln technology from West Germany, and (ii) vertical shaft kiln technology, independently developed by CRI, and the Regional Research Laboratory (RRL), Jorhat. Before any final decision is taken the relative merits of the processes have to be evaluated.

It is, however, generally accepted that the working of a mini cement plant based on vertical shaft kiln process is technologically feasible. In fact, such plants are already in operation throughout the world. In India, however, such plants are still in the experimental stage, as stated earlier [*Bull.industr.Statist.*, 1977, **2**(4), ii-ix; *Guidelines for Industries*, 1978-79, 142; *RRL News*, 1977, **1**(5), 2; *Hindu Surv. Indian Ind.*, 1977, 182; *Chem.Times*, 10.7.78; B.S., 28.12.77; Hindu, 10.6.78; F.E., 11.11.77, 29.1.78, 28.10.78; E.T., 16.1.78, 16.2.78, 2.3.78, 3.8.78].

2. INDUSTRIAL NEWS

2.1 GENERAL

2.1.1 New Guidelines on Joint Ventures

The Government of India has made certain changes in the guidelines governing India's participation in joint overseas industrial ventures, proposals entailing capitalization of service fees, royalties and other payments, or raising of foreign exchange loans abroad or grant of loans by Indian participating companies to the joint venture units.

A comparison of the modified guidelines with those which were in force earlier shows that previously Indian participation was permitted only in the form of export of know-how or indigenous machinery and equipment.

The government has also softened its attitude on the issue of cash remittance. While previously no cash remittance was permitted except small amounts required in connection with preliminary expenses for setting up the concerned company abroad, it has now been decided that in "hard and deserving" cases cash remittance towards equity contribution would be considered if the "fields of collaboration" justified it. These proposals would be considered only under the condition that they assured substantial export of capital goods and services over a long period of time.

Another new concept that has been introduced is that requests for contribution to rights issues or additional equity in a joint venture project would be considered only in the light of past performance of the project and other financial details. Such contributions would normally be through exports of machinery and equipment, but in exceptional cases exports of components and raw materials may be permitted on merit (E. T., 22.10.78).

2.1.2 Drug Reservation List

The high-power policy and planning committee for the drug industry has devised new criteria for revising the reservation lists with a view to filling the technology gap and boosting the production of vital drugs.

In pursuance with the recommendations of the committee, the Union government has drawn up a list of 40 bulk drugs, of which 30 would be reserved for the public sector and the remaining 10 for the Indian sector.

The government has also prepared a separate list of about 42 bulk drugs which are open for licensing by any sector The list of 30 bulk drugs proposed to be reserved for the public sector undertakings include penicillin, furamide, streptomycin, noscapine, tetra cycline HCl, erythromycin, sulphadimidine, semi synthetic penicillins including ampicillin, phthaly sulphathiazole, sulphacetamide, griseofulvin, vitamir B-1 and B-2, amidopyrine, rifampicin, folic acid cycloserine, calcium and panthenols, pantothenate oxytetracycline, doxycycline, piperazine and its salts all sulpha drugs which are produced locally o approved so far for other units, quinine, analgin phenobarbitone, morphine, phenacetin, and acetazol amide.

Likewise, the list of 10 bulk drugs reserved for th Indian sector of the drug industry includes items lik iodochlorohydroxyquinoline, INH, diethyl carba mazine citrate, PAS, diethylether, thiacetazone, ethy chloride, paracetamol, amitryptilene, and emetine.

A separate list of 42 bulk drugs which have been lef "open" for licensing for all sectors includ chloramphenicol, mephentermine sulphate, chlorphe niramine maleate, atropine sulphate, chlorpromazin HCl, bacitracin, vitamin A, cleandomycin, vitamin B 12, thiophental sodium, vitamin D-12/D-13, reserpine glyceryltrinitrate, homotropine, tetrachloroethylene physostigmine, insulin, menthol, DDS, thymol chloroquin phosphate, benzoic acid, primaquir phosphate, benzaldehyde, aspirin, salicylic acid, al steroids/hormones, methyl salicylate, hy drochlorthiazide, cetrimide, theophylline aminophylline, prenolamine lactate, succinyl cholin chloride, oxyphenyl butazone, nor-adrenaline tar tarate, dexamethasone, oxytocin, triamcinolon acetate, methyl ergometrine, thioridazine (malleril maleates, and isoptin (E. T., 18.10.78).

2.1.3 More Steel for Small Industries

Steel Authority of India Limited (SAIL), has planne to more than double the supply of pig iron and ste products to small scale industries during 1978-79 a compared to current supply of 212,000 tonnes of pi iron and 150,000 tonnes of steel products.

In August 1978, sales to small scale industri amounted to 24,000 tonnes of steel products an 23,000 tonnes of pig iron. As compared to averag monthly supply of 13,000 tonnes of steel and 18,0 tonnes of pig iron, the increase was 84% in steel an 27% in pig iron.

In addition to the sale of 24,000 tonnes of steel August 1978, offers to the extent of 23,000 tonnes we pending for payment by small scale industri corporations. Including this, total steel made availab to small scale industries in the first five months work

ut to 1,09,000 tonnes which is 70% of the total steel nade available during 1977-78. Similarly, 1,60,000 onnes of pig iron given to them in the first five months mount to 54% of the total pig iron made available luring the last year [*East. Economist*, 1978, **71**(13), 540].

2.1.4 STC Consultancy Services

The State Trading Corporation has entered into consultancy services for trades like leather, textile and coir products from this year. The Corporation has plans to set up a design-cum-production centre for these items. The centre will also train designers and provide consultancy services.

In 1977-78, the Corporation's turnover was Rs 1,070 crores as compared to only Rs 975 crores in 1976-77. The total export earnings were Rs 557 crores in 1977-78 as against Rs 666 crores in the previous year. Imports rose to Rs 502 crores in 1977-78 compared to Rs 301 crores in the previous year.

During the last financial year, the edible oil imports touched a record level of more than 5 lakh tonnes. The Corporation also imported 8,40,000 tonnes of cement to meet the shortage of this essential item (F.E., 1.10.78).

2.1.5 India at Cologne Meet

India has recently participated successfully in the Cologne Buyer-Seller Meet organized by the Trade Development Authority. Indian firms booked orders worth over Rs 350 lakhs at the meet. The highest share of the orders was of industrial goods followed by consumer goods. Besides, the total value of firm enquires amounted to around Rs 700 lakhs [*Econ. commerc. News*, 1978, **7**(43), 2].

2.2 ENGINEERING INDUSTRY

2.2.1 Cross-linked Cables

Universal Cables Ltd, the first unit in the country to take up the manufacture of cross-linked polyethylene cables, has gone into production. Manufactured in technical collaboration with Asea Kabel of Sweden, this new range of far superior cables has been given the trade name "Unistar Pex".

This type of cable is the latest in cable technology and is known as VLPE in America, VE in Germany, PRC in France and PEX in Sweden.

Universal has invested over Rs 3 crores on the project. The annual installed capacity is 1,600 km of cable, but the production in the current year will be 400 km only.

Besides being durable and economic, PEX is far superior to PLG, PVC and PE cables. The latest cable has higher current rating, over-load capacity and short circuit capacity. Besides these thermal properties, this cable has low weight, low dielectric losses and high flexibility. It is machanically robust and has no brittleness at low temperature.

The major raw material for PEX cables is cross-linked polyethylene compound which is for the time being imported. There is 208% duty on such imported compound, but the duty on such imported cable is only 40%, which puts the India-made cable at a disadvantage even at home. The Universal Cables has approached the government so that the duty on the compound be reduced to 40% till the Indian product comes to the market (H.T., 8.11.78).

2.2.2 Thermocouple Attachment Unit

Advani-Oerlikon has introduced a thermocouple attachment unit (TAU), which provides an ideal method of attaching thermocouples to weldments. Conventional methods used for thermocouple attachment usually give inaccurate temperature readings on the temperature recorder. In fact, the temperature indicated is not truly of the weldment being heat treated. As a result, errors ranging up to 50°C are common. However, with the TAU these errors are eliminated.

The TAU unit consists of a battery which is chargeable by a 230 Volts AC supply. The battery supplies the power to flash butt-weld the ends of thermocouple wire directly on the surface of the weldments. The "junction" of the thermocouple becomes the weldment itself. Thus, there can be no inaccuracy in the temperature measurement. Elements and heaters can over-ride the thermocouple "junction" and also the thermocouple as it leaves the junction area.

This is a portable unit, weighing only about 5 kg. It operates on the capacitor discharge system. The output circuit consists of a solid state diode, thyristor circuits for accurately discharging the capacitor energy.

The advantages of the TAU are that no welder is required to tack a thermocouple attachment to the weldment, no preheating is required for welding ferrules on alloy steel pipes, and no grinding is required. With correct temperature measurement and control, accurate Brinnell hardness values can be obtained (F. E., 2.11.78).

2.2.3 Abrasive Blasting Machine

Dry and wet abrasive blasting machines have been developed for cleaning and finishing piston rings before electroplating them. The machine has a motorized fixture to cause rotation of ring-mandrel at a pre-set

speed. There are two blast guns, which move up and down across the ring-mandrel while it is rotating. The dry or wet abrasive stream generated from the blast guns strikes at the mandrel surface, resulting in complete cleaning and finishing of the ring-mandrel. After this, the mandrel is sent for electroplating.

Alumina oxide in fine mesh is used as the blast media for this application. However, other abrasives including glass beads can be used and the machine can be modified for other surface cleaning, finishing and deburring applications. The working of the machine is safe and the process is controlled by an auto rest-timer.

For further details, contact: Metalizing Equipment Co., Chopasni Road, Jodhpur, Rajasthan [*Machine Building Ind.*, 1978, **17**(6), 18].

2.2.4 Nickel-Cadmium Batteries

The state-owned Electronics Corporation of India (ECIL) has for the first time manufactured sintered plate nickel-cadmium batteries for the Defence Department. These batteries are rechargeable. There are two types of construction in nickel-cadmium batteries, namely, the 'pocket plate' and 'sintered plate', the latter utilizes more modern technology. The sintered plate battery gives better performacnce at temperatures as low as minus 30°. It also exhibits high rate discharge capabilities by virtue of low internal resistance arising out of sintered plate construction and also gives a greater number of charge-discharge cycles as compared to pocket plate constructions. These better characteristics of sintered plate batteries and their enhanced ruggedness and reliability make them eminently suitable for military applications.

These batteries also find application in powering portable electronic equipment such as test equipment and communication equipment.

The range of nickel-cadmium batteries produced by ECIL covers an ampere-hour capacity of 1, 2, 4, 7 and 10. The batteries are made in sealed construction with a detachable safety valve. The batteries can be supplied in required voltages (in integrate multiples of 1.2 V) as demanded by the application (F. E., 29.10.78).

2.2.5 Impending Cave-in Signal Device

Dr Stuart Hoenig, a professor of electrical engineering at the University of Arizona, is planning to manufacture a small inexpensive detector which will help in preventing mining disasters. His idea is based on the fact that moisture-bearing rocks generate an electric charge when placed under stress. The detector would give a signal when the charge reaches a specified level. Placed throughout a mine, such detectors would give advanced warning of a wall or roof about to give way (*Design News*, 8.5.78, 14).

2.2.6 Concrete Saw

India's first concrete sawing machine has bee manufactured by Macman Engineers (India) Ltd, 52 Tulsipipe Road, Bombay-28. The machine is mobil and can be driven by electric motor or diesel engin The spindle, on which is mounted a segmenta diamond saw, is totally enclosed. The blade is force into the ground by a conveniently placed handle whic is also used in pushing the whole machine and cuttin the concrete asphalt floor. A self-propelled drive is als available.

For straight line and stable cutting, an arrangemen is provided in the front (E. T., 1.10.78).

2.2.7 Extrusion Cooker

Bangalore Tool Works Pvt. Ltd, has manufacture an economical, easy to operate, versatile extrusio cooking system which is a fully engineered unitary foo processing machine.

This improved model of extrusion cooker, the S100 M02, is a higher powered unit than last year's S100 M01 unit. Now with a 60 h.p. screw drive, thi extrusion cooker can manufacture expanded product of large variety by the HTST (High Temperature Shor Time) process from various cereal flours, processed singly or in mixes. Wheat, rice, corn, tapioca and other cereals can all be converted into pasteurized, ready-to- eat crunchies. The capcity of the system is 150 kg/h (1000 tonnes/annum) at a process cost between Rs 0.8/ kg to Rs 1.5/kg. The range of products comprise weaning foods, adhesive bases, dextrines, vegetable protein meals, pet foods, breakfast foods, pre-cooked cereal flours and low cost high protein and other energy foods.

2.3 CHEMICAL INDUSTRY

2.3.1 Gasification and Liquefaction of Coal

Gasification—Use of coal gas for heating instead of coal itself has certain obvious and well known advantages. The snag lies in efficiency of gasifying and purifying the gas, building a pipeline grid, and in the overall economics of gasification and distribution. Coal gasification features prominently in Japan's Sunshine Project, which comprises long range research for the development of new sources of clean and efficient energy. At the Coal Technical Research Centre in Yubari in the northern island of Hokkaido a large pilot plant for coal gasification has been designed fabricated and run for 100 consecutive hours. The plant is capable of converting up to 5 tonnes of coal a day into low-calorie (about 1,300 kilocalories) gas for use in power plants.

The Yubari plant has pressurized, two-level, liquid er system incorporated in a furnace 25 m high and m in dia. Pulverized coal is poured from the top and and steam at high temperature enters from the ttom to produce a gas composed of CO and H_2. The al powder is in a constant fluid state at two levels, the per maintained at 700°C and the lower at 1,000°C.

With the success of the above plant, Yubari scientists e planning a combined cycle plant where the coal gas ould be used to produce electricity in a gas turbine d the exhaust heat from this turbine would be used to rn a steam turbine. The combined cycle plant is pected to produce gas at a cost and efficiency which ill compare favourably with direct burning of coal.

As regards increase in size of gasification plants, the ubari research centre expects to put up a plant by the nd of 1979 which will convert 40 tonnes of coal into as in a day. In 1980 a demonstration plant capable of onverting 250 tonnes of coal a day and producing 0,000 kW of electricity would be built. (Narain, Hindu, 1.11.78).

For India too gasification of coal holds considerable nterest, as the country has a large reserve of non-oking coal whose fuel value would increase on gasification. The Central Research Institute, Dhanbad, and the Regional Research Laboratory, Hyderabad, are doing good work on the gasification of various ypes of Indian coals on pilot plant scale. However, the economics of production and distribution are likely to pose serious problems.

Liquefaction—The technology of liquefaction of coal to oil was invented by German engineers before World War II and the oil thus produced was used by Germany during the War. However, the cost of such oil was much too high for it to have any peace-time use. With the rising price of petroleum, interest in oil from coal has been revived. From 1974 to 1978 the cost of oil from coal has come down from four times to double the cost of central heating oil refined from petroleum crude. According to Prof. Werner Peters of Essen Mining Research Institute, coal liquefaction will be economically viable by 1990.

A pilot project for coal liquefaction is underway in the Ruhr coalfield of West Germany. The process is an improvement of the pre-war Bergius-Pier technique. Coal is liquefied at high pressure by catalytic hydrogenation. The resulting hydrocarbons are suitable for use both as fuel and as raw materials for the petrochemical industry. The pilot plant will have a capacity of liquefying 400 tonnes of coal per day which will produce 200 tonnes of oil (Hindu, 1.11.78).

In India work on producing oil from coal and coal tar is in progress at the Central Fuel Research Institute, Dhanbad.

2.3.2 Cyclohexane Plant

A one-tonne per day prototype cyclohexane plant developed and designed by the Regional Research Laboratory (RRL), Hyderabad, and based on the catalyst developed by the laboratory has been commissioned at the Gujarat State Fertilizer Corporation Ltd (GSFC), Baroda. The plant converts benzene into cyclohexane, a basic raw material in the manufacture of nylon 66. Presently, GSFC is producing cyclohexane using imported catalyst.

GSFC envisages the setting up of a commercial plant for cyclohexane on the basis of the RRL know-how.

2.3.3 Liberal Imports for Petrochem Units

The Union Government has allowed liberal imports of process technology for several industries producing basic petrochemicals.

It has been observed that more than 90% of the industries use imported technology in view of the sophistication needed for the manufacture of organic chemicals, synthetic fibres, plastic raw materials and synthetic rubber. However, only in a few case the manufacturers have sought foreign collaboration.

The Mafatlal Group have been allowed to seek foreign equity participation for their synthetic fibre project. Union Carbide has been permitted to secure the process technology needed for the production of several basic petrochemicals from its principals abroad. In respect of the public sector, only Petrofils have foreign equity and loan participation. The other two State undertakings in the petrochemicals area, viz. BRPL and IPCL are largely self-reliant.

The Government's overall policy on petrochemicals envisages the setting up of palnts which are economic. Besides making adequate provision for on-going schemes in the public sector projects at Baroda and Bongaigaon, the Sixth Plan has provided outlays for a large olefin complex, a plant for the recovery of benzene, xylene and toluene and a polyester plant. The Sixth Plan has assigned a significant role to the private sector in the production of both basic petrochemicals and products based on them.

The total Sixth Plan outlay on petrochemical projects is Rs 203 crores. This will supplement the IPCC Baroda Project, the petrochemical project at Bongaigaon in Assam and the completion of the polyester filament yarn project in the cooperative sector at Baroda.

The new schemes are: (i) gas naphtha cracker and downstream units, Rs 100 crores; (ii) aromatic recovery facilities, Rs 40 crores; (iii) synthetic fibre intermediates, Rs 40 crores; (iv) polyester stable fibre (4500 tonnes), Rs 10 crores; (v) polypropylene and linear alkyl benzene,

Rs 10 crores; and (vi) polyester filament yarn, Rs 3 crores (F.E., 29.10.78).

2.3.4 Alcohol-based Units in Haryana

The Haryana Government has decided to set up a network of alcohol-based industrial units.

According to an official estimate, Haryana produces about one crore litres of proof alcohol every year, most of which is consumed as liquor. At present, there is only one alcohol-based unit in the private sector (E. T., 1.10.78).

2.3.5 Electrothermal Process for Calcium Silicide

The Central Electrochemical Research Institute (CECRI), Karaikudi, has developed an electrothermal process for the production of calcium silicide (calcium content 30%).

Calcium silicide finds major application as a deoxidizing and desulphurizing agent in the iron and steel industry, and as an inoculant in foundry industry. It also finds applications in defence-oriented industries.

CECRI has also set up a plant capable of producing 27-30 kg of calcium silicide per batch (3-3$\frac{1}{2}$ hr) using 380 kVA arc furnace. The total investment to set up a plant capable of producing 100 tonnes per annum of this chemical has been estimated at Rs 12.4 lakh. The production cost has been worked out to be Rs 16/kg and the return on investment at 32%

The present annual demand of about 100-150 tonnes is being met by imports [*Econ. Trends*, 1978, **7**(18), 61].

2.4 MISCELLANEOUS INDUSTRIES

2.4.1 Big Scope for Leather Exports

A research study has found that leather exports are likely to increase to Rs 550 crores in 1978-79 and could go as high as Rs 1,000 crores by 1984-85.

It is expected that the slaughtering of the less economic milch cattle will improve the availability of hides by at least 20% till the end of 1984/85. However, if the banks begin to invest still larger sums amongst landless agricultural labourers for them to take up animal husbandry, then the availability of hides and skins could further increase by 35% and exports could reach Rs 1,250 cores.

The study further points out that with availability of large number of uneconomical cattle for slaughter, the setting up of scientifically equipped slaughter houses is very necessary to get the most of the otherwise uneconomical cattle. With the properly organized slaughter houses even some other industries using gelatin, hoofs and horns, and fleshings of skins could also be expanded, particularly when they are suffering from the lack of raw materials (E.T., 13.10.78).

2.4.2 Curing Hides

The Central Leather Research Institute, Madra has developed a simple and economical method fo purification of used salt for re-use in curing of hides an skins.

In the above process, the saturated brine of used sa is allowed to sediment in a tank for 48 hrs to remov insolubles and to reduce bacterial contaminatio considerably. The supernatant is decanted an evaporated to dryness in an open cemented yard. Th recovery of salt (purified) is 75-80% with 95% sodiur chloride content.

There are several advantages of using this purifie salt: (i) it is much better in quality than the market sa (non-purified) due to low contamination of bacteria i purified salt; (ii) the quality of leather obtained fron skins cured with purified salt is found to be superior t that obtained with market salt, the grain damage bein highly perceptible in skins cured with the fresh sal (non-purified) which is available in the market fo curing; (iii) environmental pollution can be avoided and (iv) it has been found that addition o trichlorophenate to the recovered salt improves th efficiency of curing (F.E., 29.10.78).

2.4.3 Cement Substitute

A new type of semi-hydraulic dry-hydrated lime wi be produced by a joint venture plant to be set up by th Housing and Urban Development Corporation nea Gwalior. This unit, to be set up in collaboration wit the Madhya Pradesh Housing Board, would serve th needs of Haryana, Delhi, Uttar Pradesh and wester Madhya Pradesh.

The new product is a cheap and effective substitut for cement.

The plant is expected to reach a capacity of 60,00 tonnes annually in two stages [*Chem.Times*, 197 **5**(37), 12].

2.4.4 Indigenous Instant Tea by Tocklai Scientists

Some instant tea samples with an excellent quality c brew have been manufactured for the first time wit indigenous technology at a pilot plant at the Tockla Experimental Station, Jorhat, of the Tea Researc Association, Calcutta. In two factories in south Indi which use foreign technology, the poor quality of th product has been the main problem in instant te production. This problem has been successfull overcome in the Tocklai process. The cup quality an aroma of the brews of instant tea samples produced i the Tocklai plant are indistinguishable from the brew of good-quality orthodox teas, according to the te

ters. The Tocklai process is based on the upscaled nch process developed at the University of Calcutta der a Tea Board scheme.

The team of project scientists at Tocklai are now gaged in collecting engineering and processing data finalize a blueprint for commercial production of t- and cold-soluble instant teas for markets at home d abroad. Modern management techniques (PERT d CPM) are now being used for monitoring the ogress of research and early completion of the blueprint for setting up an instant tea commercial plant with indigenous technology and machinery.

2.4.5 New Coal Projects

In order to meet the rising demand for coal in the country, nearly 153 new coal projects would be taken up this year. Of these, 106 new mines are to be taken up by the Coal India alone, the rest being developed under Singareni Colleries and TISCO. Coal India's project would cost around Rs 70 crores (E.T., 26.10.78).

3. ANNOUNCEMENTS

3.1 AWARDS

3.1.1 Conservationist of the Year Award

The Centre for Documentation and Training of Preventive Maintenance Welding has invited applications for the presentation of the Conservationist of the Year Award for 1978. The purpose of the Award is to stress the need to eliminate industrial waste, and reduce manufacturing costs and inventory of spare parts through preventive maintenance welding.

The last date for sending the application forms is March 31, 1979.

For further details contact: The Centre for Documentation and Training of Preventive Maintenance Welding, Larsen & Toubro Limited, P.O. Box 304, *Bombay*-400 021.

3.1.2 Maharashtra Government Export Award

This Award has gone to Start-Rite Shoes Pvt. Ltd, a footwear manufacturing unit in the small sector. The company has won this award for the third consecutive year.

With a meagre paid-up capital of Rs 60,000 the company has shown spectacular export drive. In 1974-75, it exported footwear worth Rs 25.21 lakhs. The following year, 1975-76, it doubled its exports to Rs 52.25 lakhs. In 1976-77, it further stepped up exports to Rs 1.04 crores. In 1977-78, the export for footwears by this company totalled Rs 68 lakhs. The company has set up an export target of Rs 1.5 crores for the current year (F.E., 24.9.78).

3.1.3 Hari Om Awards

Ahmedabad Textile Industry Research Association (ATIRA), Ahmedabad, will institute an annual award for the most outstanding scientific or technological contribution in India in various fields of textile sciences.

The award, namely, "Hari Om Ashram Prerit Ranchhodlal Chhotalal C.I.E. Research Award Endowment" amounts to Rs 50,000.

The following scientific contributions will be considered for the award: (i) scientific/technical achievement in textile technology, textile chemistry, synthesis of dyestuffs, fibre science and designing of textile machinery; (ii) solution of short-term critical problems facing the textile industry; (iii) process/product development of commercial value to the Indian textile industry (product would includ machinery and instruments); and (iv) outstandin contribution toward the scientific understanding o important phenomena in textile manufacture.

Application forms can be had from the Director ATIRA, Post Polytechnic, Ahmedabad-380 015. *The last date for receipt of entries is* 31 *December* 197 [*Indian Text J.*, 1978, **88**(12), 91].

3.1.4 Import Substitution Awards

The Board of Awards for Import Substitutio selected eleven firms for Independence Day Nationa Awards for developing import substitutions.

Out of the 11 firms, 3 got silver shields, 7 bronz shields, and 1 certificate of merit. Those who receive silver shields are: (i) Stainco Enterprises Pvt. Ltd., Ne Delhi (for the development of spray drying plant); (i Suri & Nayar Ltd., Bangalore (for the development o flameproof diesel hydraulic locomotive); and (ii Synthetics and Chemicals, Bombay (for th development of nitrile rubber).

The bronze shield winners are: (i) Swifts Pvt. Ltd Bombay (for the development of offset printin machine); (ii) Micro Mechanical Works, Bombay (fo the development of three-ply automatic combine paper corrugating plant); (iii) Pratap Steel Rollin Mills Pvt. Ltd, Amritsar (for the development of flang and cockring section); (iv) S.A.J. Steel Pvt. Ltd, Pun (for the development of water brake dynamometer); (v Bharat Earthmovers Ltd, Bangalore (for th development of 50-tonne tank transport trailors); (vi Vasu Chemicals, Bombay (for the development o inhibitol); and (vii) Rishiroop Polymers, Bombay (fo the development of chlorinated rubber).

The certificate of merit has gone to R.S. Rau Kolhapur for the development of (a) various type o flexitallic type spira wood metallic gaskets for diese locos and (b) nozzle cooling sleeves.

The items developed will result in an annual savin of nearly Rs 700 million in foreign exchange.

Such awards are given twice on the Republic Da and Independence Day every year to recognize an encourage import substitution efforts by institution and individuals [*Econ. commerc.News*, 1978, **8**(35), 8

3.2 FAIRS

3.2.1 Leipzig Fair

The Trade Fair Authority of India will participate i the Leipzig Spring Fair scheduled to be held from 1 18 March, 1979.

The various items to be displayed in the Fair include ıchine tools and accessories, machinery and uipment, minerals and metals, material handling uipment, electrical engineering and automotive uipment, railway rolling stocks, foods and everages, leather manufactures, handloom and andicrafts, and other products that have recently nerged in the expanding horizon of India's trade omposition.

This Fair should offer immense opportunities to the ading community throughout the world for exchange f ideas and goods.

.2.2 INMAF '79

This fair will be organized by the All India Manufacturers Organisation and will be held at Bandra Reclamation Grounds, Bombay from 17 March to 15 April 1979.

This is a good opportunity for all industrialists to lisplay their products and meet foreign buyers. There s reservation of special plots for those who wish to xhibit and sell their products.

*Further details can be had from The General Manager, INMAF'79, C/o All India Manufacturers Organization, Jeevan Sahakar, 4th Floor, Sir P.M. Road, Fort, Bombay-*400 001

3.3 TRAINING

SIET Courses

The Small Industry Extension Training Institute, Hyderabad, is starting training courses during anuary-March, 1979.

The various training courses, their durations and dates of commencement are given below:

(i) Industrial Engineering Techniques for Modernization; 1 Week; January 1, 1979

(ii) Information Storage and Retrieval Systems; 4 Weeks; January 8, 1979

(iii) Regional Planning with emphasis on Integrated Area Development; 3 Weeks; January 22, 1979

(iv) Material Management; 2 Weeks; February 5, 1979

(v) Working Capital Management; 1 Week; February 12, 1979

(vi) Process Management for Ceramics and Glass Industries; 2 Weeks; February 19, 1979

(vii) Market Survey and Demand Analysis; 2 Weeks; March 5, 1979

(viii) Planning and Promotion of Agro Industries; 3 Weeks; March 5, 1979

*For further details and application forms contact: The Assistant Registrar, SIET Institute, Yousufguda, Hyderabad-*500 045.

3.4 PUBLICATIONS

3.4.1 Productivity Trends in Cement Industry in India, by V.K. Goel and N.K. Nair; National Productivity Council, New Delhi; Pp 156, price Rs 60.

The report is of special significance to the planners and policy-makers of the cement industry. The publication gives an exhaustive review of the industry's financial performance, and various aspects of cement pricing. It also presents a perspective of the cement industry in the Sixth Plan period (F.E., 29.10.78).

3.4.2 Export Management, by Y.R. Ullal; Noble Publishing House; Bombay 400 004; Pp 471, Price Rs 25.

This book is divided into seven chapters. In the chapter on international trade, a thorough description of various measures to promote a country's trade is given. In the chapter on export pricing, the author has provided some case studies. The author has given a detailed account of various financial institutions helping the export efforts of our country.

The chapter on export procedure deals with various formalities that are required and the forms to be filled in. The author has discussed in detail the export procedures under various modes (E.T., 29.10.78).

3.4.3 Power For Development - An Overview, Punjab, Haryana and Delhi Chamber of Commerce, New Delhi; Pp 384, Price Rs 40.

The publication is a collection of the background papers and a fairly comprehensive coverage of the proceedings of the last conference on the theme - power for the development of agriculture and industry. The inclusion of the major recommendations of various workshops and seminars organized by both governmental and private institutions, as also of the Fuel Policy Committee, helps the reader to appreciate the wider dimensions of the problem. This is further strengthened by the statistical data provided on installed capacity, power generation, sectorwise and per capita consumption, outlays on power generation schemes over last two years, and the shortages experienced last year (E.T., 1.10.78).

3.4.4 Industrial Directory, Vyapar - Udhyog Darshan (Maharashtra), edited by Rasilkant A. Shah; Maharashtra Audyogic Prakashan, Syndicate Bank Building, Sir P.M. Road, Bombay-400 001, Price Rs 75.

The Directory provides up-to-date information on the industries in Maharashtra, all industrial products, their manufacturers, industrial policy, industrial location policy, industrial areas, cooperative industrial

estates, and addresses of all chambers of commerce and business and industries associations.

In the end, full details about procedures relating to various aspects involved in setting up an industrial unit are given, which will be helpful to an entrepreneur (E.T., 22.10.78).

3.4.5 Exporters - Trade Terms, Forms and Documents and Organizations and Agencies by Paras Ram; Anupam Publishers, WP 456, Wazirpur, (Ash Vihar), P.O.Box 8405, Delhi-110052; Pp 248, Price 35.

The book covers definitions of financial, shippi marine insurance, pricing, costing and payment terr definitions of facilities to international traders, and terms and documents and the procedures for th submission. The book can serve both as a dictionary trade terms and a manual of trade organizations a agéncies (F.E., 24.9.78).